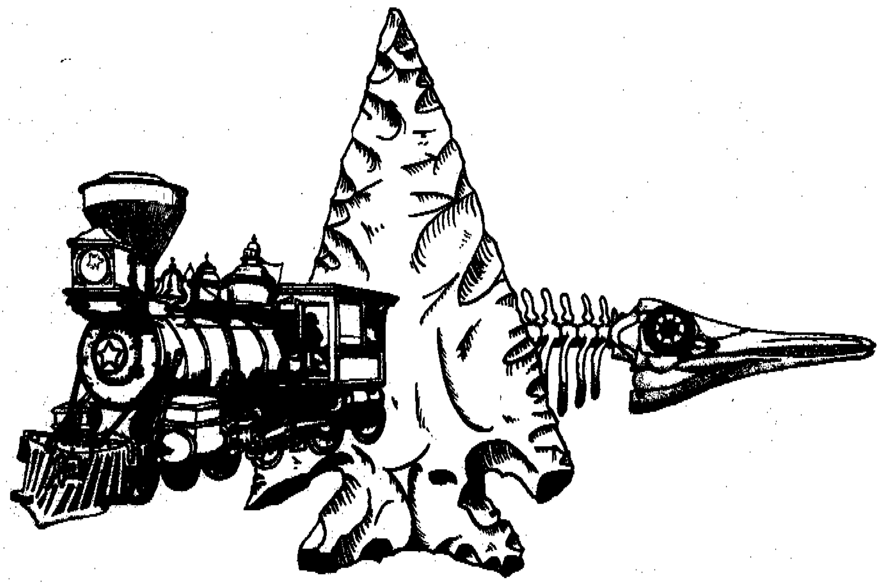
BUREAU OF LAND MANAGEMENT
NEVADA

CONTRIBUTIONS TO THE STUDY OF CULTURAL RESOURCES



# TEST EXCAVATIONS AT PAINTED CAVE, PERSHING COUNTY, NEVADA



TECHNICAL REPORT NO. 5

U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

RENO, NEVADA　　FEBRUARY, 1980

# TEST EXCAVATIONS AT PAINTED CAVE, PERSHING COUNTY, NEVADA

FOR

BUREAU OF LAND MANAGEMENT
WINNEMUCCA DISTRICT OFFICE

Contract No. NV950-RFQ-0010

ANTIQUITIES ACT PERMIT 78-NV-030

BY

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AUGUST, 1978

# Forward

Test excavations were conducted at Painted Cave in the summer of 1978. The small rockshelter lies east of Lovelock and is located in the shadscale vegetation zone of northwestern Nevada. The archaeological record in the general region has been studied over the past half century and, as a result, the accumulated information offers a background for formulating cultural resource evaluations. In addition to buried cultural materials, the rockshelter also contains a number of pictographs on the walls.

The site has been damaged by vandals, and stream erosion poses a threat to the deposits. Consequently, the project was undertaken not only to provide a record of the rock art and of the cultural deposits on the floor, but also to determine if enough scientific potenial exists at present to warrant future research.

Several discrete firehearths and an occupational/living floor were revealed by the archaeological excavation; small finds largely consisted of chipped stone artifacts and pigment stones. Analysis of faunal remains, palynological data and the cultural record, indicates that the site was a seasonally-occupied camp from which the inhabitants exploited multiple resources in the vicinity. Bifacial point styles and radiocarbon dates indicate a late prehistoric period of occupation.

The work just completed shows that the site possesses considerable potential for future scientific studies, and a protective monitoring plan has now been implemented to protect this potential.

Richard C. Hanes
BLM, Nevada State Office
February, 1980

ACKNOWLEDGEMENTS

The archaeological investigations at Painted Cave were contracted for by the Bureau of Land Management, Winnemucca District Office. To Mr. John Roney, District Archaeologist, we express our thanks for his field assistance, advice and good company as well as his concern for preserving and interpreting Nevada's prehistory.

Mr. Glenn Markoe (University of California, Berkeley) and Ms. Susan Seck (University of Nevada, Reno) field crew assistance was greatly appreciated as are the excellent artifact illustrations of Ms. Pamela Endzweig. Their clarity and precision add considerably to the report.

A special note of thanks is due to Dr. D.H. Thomas (American Museum of Natural History) for his information on central Nevada prehistory and to Dr. D. Burke (US Geological Survey) for general assistance with the local geology and geomorphology. Dr. Roger Byrne (Department of Geography, University of California, Berkeley) and Mr. Herb Meyer (Department of Paleontology, University of California, Berkeley) deserve special thanks for their ecological advice and palynological expertise. Dr. Rainer Berger's (University of California, Los Angeles) assistance in running the radiocarbon dates is also appreciated.

A special note of thanks is due to Dr. Robert F. Heizer (Department of Anthropology, University of California, Berkeley) for his comments and ever helpful advice. The staff of the R.H. Lowie Museum of Anthropology, University of California, Berkeley, and especially Mr. D. Herod is thanked for their general assistance and many courtesies.

Ms. Adele Fukuba and Ms. Marianne Stam deserve special consideration for their general logistical assistance throughout both the field work and report writeup.

TABLE OF CONTENTS

## LIST OF MAPS



## LIST OF FIGURES

LIST OF TABLES

## INTRODUCTION

Painted Cave, located approximately 55 miles (88 km) east of Lovelock and 75 miles (120 km) south of Winnemucca in west central Nevada (Maps 1 and 2), was apparently first noted by a professional archaeologist sometime in the early 1930's during a brief visit to the Pleasant and Dixie Valley areas (Heizer, personal communication, 1978).

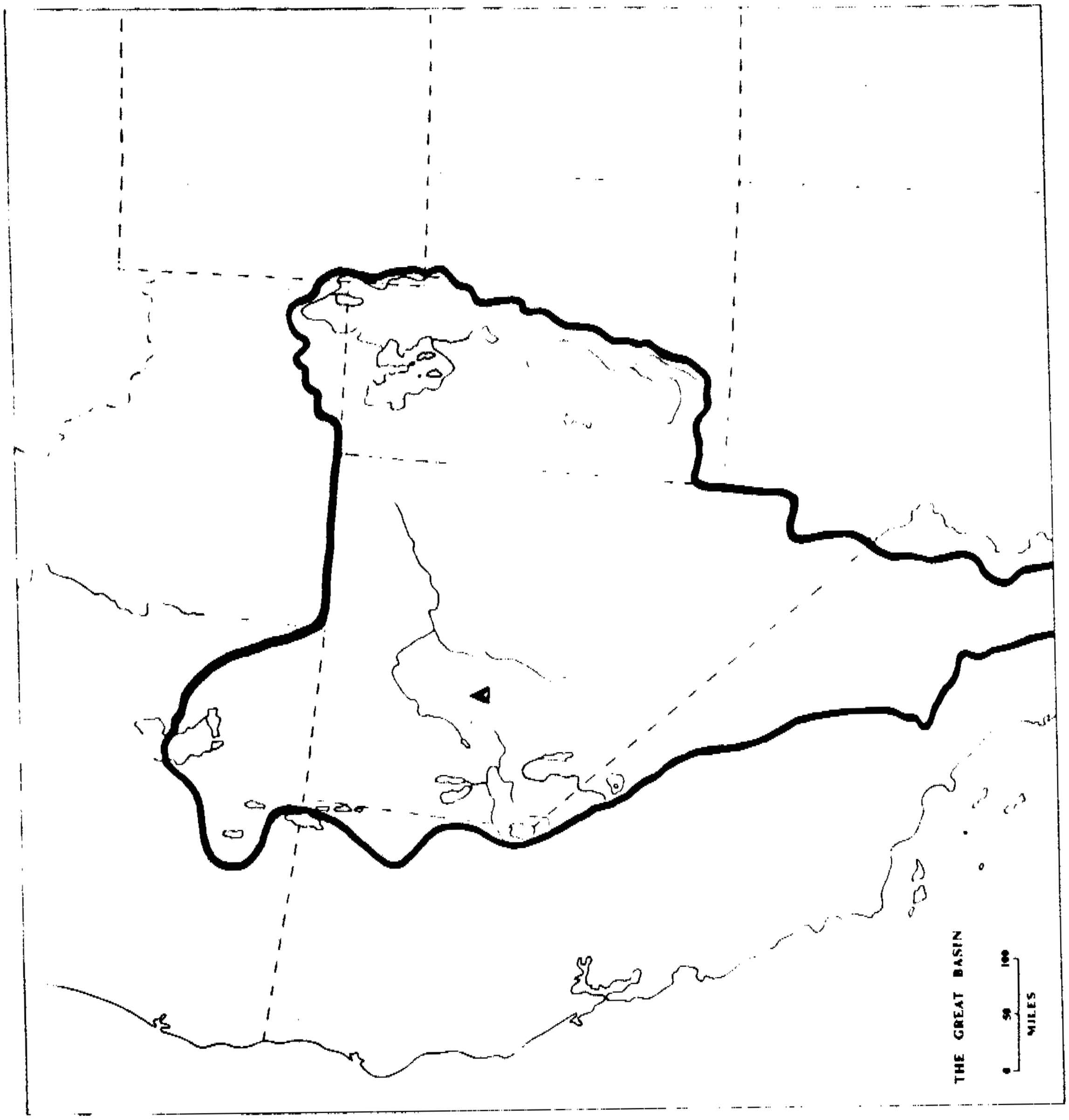
The site is a small rockshelter in an upright, asymetrical anticline (Fig. 1 and 2). The shelter has been formed by mechanical weathering and fracturing along the bedding planes in the Triassic Age Natchez Pass Formation (Johnson 1977). Painted Cave is situated on land administered by the Winnemucca District of the Bureau of Land Management and is designated as site NV Pe 40 in the files of the Archaeological Research Facility, University of California, Berkeley.

Located in a narrow gorge and facing to the north, the site is at an elevation of ca. 4020 feet (3676 m) and overlooks Spring Creek, an ephemeral source of water situated ca. 2.0 meters below the site. The main occupation/use area of the site is roughly square in outline (Map 3) measuring ca. 10.0 meters across the entrance and ca. 3.0-8.0 meters deep from the drip-line back to the rear wall. The height of the shelter roof ranges from a minimum of 40.0 cm near the edges to a maximum of 2.5-3.0 m at the center of the site. The height at the rear wall in the vandalized areas (Map 3) ranges from 2.5 to 3.5 meters. Examination of the shelter's floor indicated that the previously level surface had been badly disturbed by prior vandalism. A small apron directly in front of the site slopes gently down towards the slight bank of Spring Creek.

Zoomorphic, anthropomorphic and curvilinear design pictographs in red, white and yellow/orange pigments cover a large portion of the rear wall of the shelter (cf. Appendix II and VIII).

## MANAGEMENT OBJECTIVES

The excavations at Painted Cave were guided by a contract research design previously agreed upon by personnel of the Cultural Resources Section of the Bureau of Land Management, Winnemucca Office. Excavation of this vandalized rockshelter was conducted primarily to (a) further evaluate the need for large scale work at the site and (b) to establish a baseline




Map 1

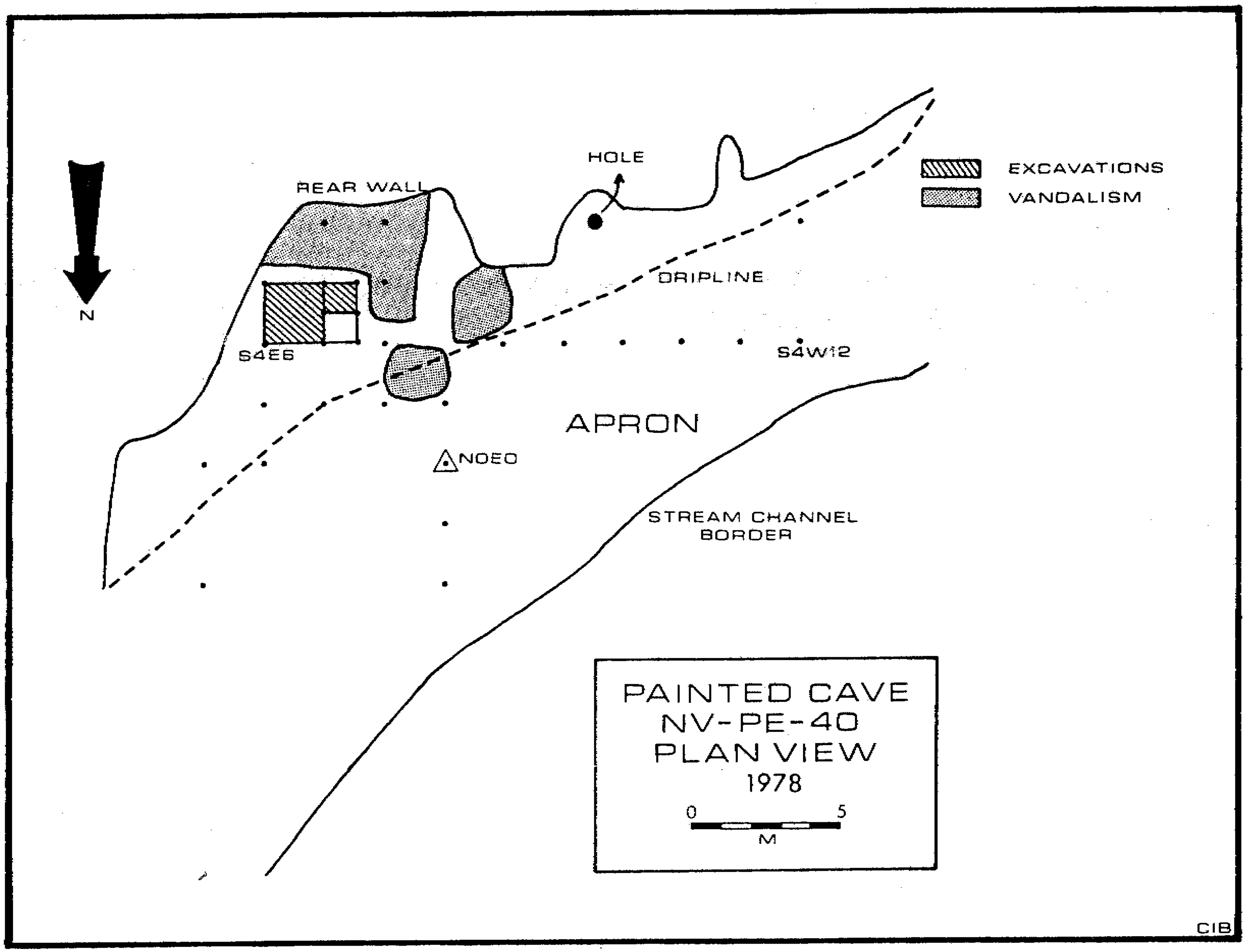
Bureau of Land Management, Nevada
Contributions to the Study of Cultural Resources
Technical Report No. 5

Test Excavations at Painted Cave, Pershing County, Nevada. 1980.

NOTE: The original page containing a map/figure/record with specific locations of archaeological resources has been deleted from this report in order to protect the confidentiality of the site location. Qualified persons holding a valid Bureau of Land Management, Nevada, cultural resources special use permit with need to examine this information may contact the appropriate BLM field office for further information.

Map 2

Map 3


PAINTED CAVE
NV-PE-40
PLAN VIEW
1978
0
5
M
EXCAVATIONS
VANDALISM
N
HOLE
REAR WALL
DRIPLINE
S4E6
S4W12
APRON
NOEO
STREAM CHANNEL BORDER
CIB

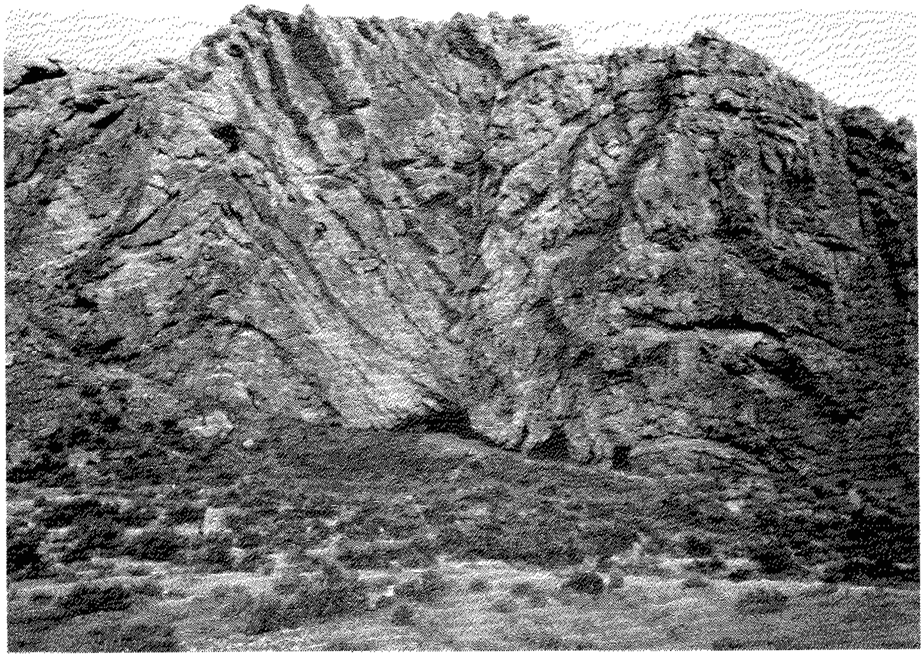


Figure 1: View of Painted Cave and formation (#9.22).

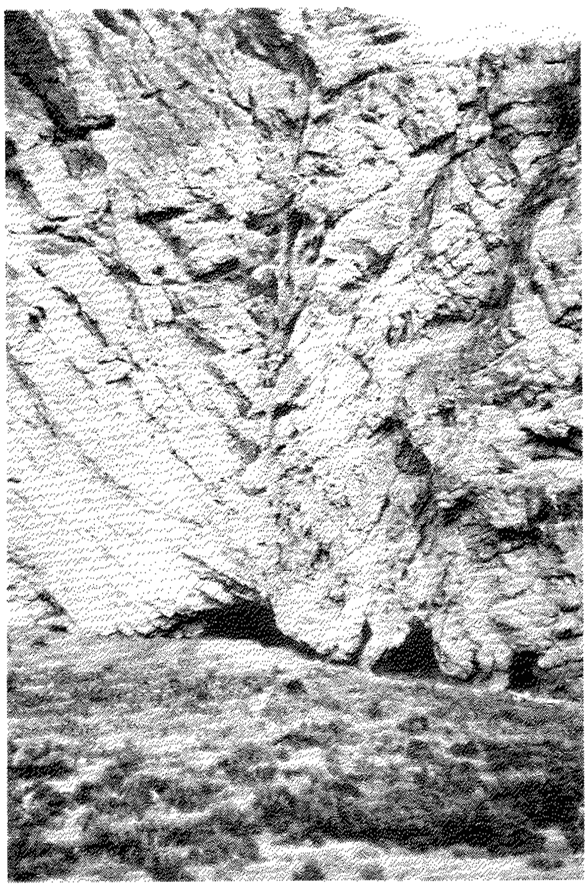


Figure 2: View of Painted Cave and formation (#1.5).

for estimating any required future funding levels. To meet these objectives our limited test excavations were directed by contract stipulations to:

(1) provide a basis for estimation of volume of fill and expected densities of cultural material in the shelter;

(2) identify the range of cultural and paleoenvironmental data which should be considered in future work; and

(3) evaluate, as far as possible, the degree to which the site is threatened by natural processes.

In brief, the research design was oriented towards producing the maximum evaluative/interpretive data to be utilized in determining a detailed protection plan for the preservation of this potential National Register site. Our results are presented below.

## NATURAL SETTING

### Geology and Geomorphology

Physiographically the area is within the Great Basin section of the Basin and Range Province (Fenneman 1931) and is characterized by northwest trending mountains most of which are small with very irregular outlines. More than half of the general area consists of broad valleys and alluvial fans (bajadas) with the remaining part consisting of mountain ranges, mesa and foothills. Large playas are a common characteristic of the valley bottoms (Cronquist, et al. 1972).

The site is in a narrow gorge along the present borders of Spring Creek at the northern end of Dixie Valley, Pershing County, Nevada. While not directly visible from Painted Cave, the Sou Hills and the northern Stillwater Range are to the west and southwest; the East Range is to the northwest; and the Tobin Range is to the northeast. The boundary between Jersey Valley and Dixie Valley is to the southeast as are the Augusta Mountains and the Pershing-Lander County border (Map 2).

Painted Cave is located in the Natchez Pass Formation which is largely composed of massive carbonate rocks (limestone) with subordinate terrigenous clastic beds and volcanic flows and breccias (Johnson 1977:16). The surrounding formations are mapped as Miocene and Pliocene sedimentary rocks and Pleistocene/Holocene alluvium in the canyon bottoms. Johnson (1977) should be consulted for a general view of the geology of the region (See also Appendix VI).

## Vegetation

A knowledge of the present resources and environment along with an understanding of past conditions is a necessity in all anthropological/archaeological studies dealing with the Great Basin due to the local variations in both culture and environment. This is especially so, in spite of the seeming uniformity of both culture and environment, with the present emphasis and interest in what has been called the 'systems approach' dealing with the correlation of environmental and archaeological data to yield a picture of settlement patterns, subsistence activities and the cultural adaptation to the resources available to the prehistoric inhabitants of the Basin (cf. Clarke 1968, Gunn 1975, Bettinger 1977, Thomas 1971a, 1972a,b, 1973 among others). The following brief discussion on the vegetation and wildlife is presented because it is necessary to have an understanding of the natural conditions with which the aboriginal inhabitants interacted and to indicate the variety of resources and conditions available to the prehistoric occupants of Painted Cave.

The study area belongs environmentally and vegetationally to the Great Basin Desert (cf. Shantz 1925, Shreve 1942, Fautin 1946). Floristically the area is included within the extreme northern boundary of the Tonopah Section of the Great Basin Division of the Intermountain Region as defined by Cronquist, et al. (1972:Fig. 56). The vegetation of the area is characterized by the dominance of *Atriplex confertifolia* (shadscale) communities and roughly corresponds to the Shadscale Zone of Cronquist, et al. (1972:Fig. 1 and 3).

These communities can be described as being dominated by low, widely spaced, more or less spiny, grayish, small-leaved shrubs which cover only about 10% of the ground area. Species composition appears to be under the major control of the geologic origin of the soil materials. The local or sporadic distributions of most species are due to local variations in edaphic variables. Several distinct plant associations and species are linked directly to local soil conditions. *Atriplex-Kochia americana* commonly occurs on the heaviest textured soils in the area and on deep, loose sands the most predictable species is *Artiplex canescens* (Four Winged Saltbrush). The edaphically controlled communities are the halophytic one of which the most important is the *Sarcobatus* (greasewood) association. This

Figure 3: View down canyon from NV Pe 40 showing terrain and vegetation (#1.12).

Figure 4: Unit S6E6, Level 20-30 cm illustrating quadrant technique of excavation (#2.2).

association, dominated by Sarcobatus vermiculatus, usually occurs in the valley bottoms in saline clay soils around the margins of playas with a sparse herbaceous cover. The main dominant of the zone, Atriplex confertifolia, commonly occurs in mosaic with Ceratoides lanata, a valued forage plant. Since this zone covers large areas of the nearly level terrain of the basin floors it has been subjected to heavy grazing pressure by local ranchers. This has led to the introduction of an introduced annual, Halogeton glomeratus, which is now a serious problem.

At some time in the past, a band of riparian vegetation was probably present along the banks of Spring Creek. A diversion dam now present upstream now stops the flows of water and riparian vegetation is present only at the northern entrance to Spring Creek Canyon. The following floristic lists include the more common plant species found in the zone. Cronquist, et al. (1972) should be consulted for more complete lists.

Grasses:

Bromus tectorum
Hilaria jamesii
Oryzopsis hymenoides
Sitanion hystrix
Stipa spp.

Forbs:

Iva spp.
Halogeton glomeratus

Shrubs and Cacti:

Artemisia spinescens
Atriplex spp.
Chrysothamnus spp.
Ephedra nevadensis
Ceratoides lanata
Grayia spinosa
Kochia americana
Opuntia spp.
Sarcobatus spp.

## Fauna

In terms of mammalian fauna the study area lies within the boundaries of the Upper Sonoran Life Zone as described by Merriam (1898:36). These life zones, essentially based on temperature gradients have been described in some detail by Hall (1946) in his monumental work on the mammals of Nevada. Hall (1946:33-37) lists several species of small mammals indicative of the Upper Sonoran zone and notes that the total number of species occurring in the zone totals 83 (the largest number of all zones). Hall (1946) and BLM (1973) should be referred to for a listing of mammals occurring in Nevada according to Life Zone.

In terms of primary economic or subsistence utilized species (cf. Steward 1938, 1941 and Stewart 1941), mammals (especially Rodentia and Lagomorpha) and large herbivores; blacktailed deer (<u>Odocoileus</u> <u>hemonius</u>), antelope (<u>Antilocapra</u> <u>americana</u>), bighorn sheep (<u>Ovis</u> <u>canadensis</u>) are found seasonally in all but the highest zone and are primarily located in the Upper Sonoran and Transition Life Zones.

Van Denburgh (1922), Stebbins (1966) and BLM (1975) describe the species of reptiles common to the area (mostly diurnal lizards and nocturnal snakes) and La Rivers (1962) and BLM (1974) should be consulted for a discussion of the fish resources present in the region. Lindsdale (1936) and BLM (1976) discuss and list the avifauna of the area.

## Soils

Billings (1949) has characterized Shadscale Zone soils for the most part as typical gray desert soils with carbonates accumulating not far beneath the surface. Soil color ranges from an ashy gray to a light buff and the soils are always light. Surface soils are usually sands with a high proportion of rock while subsoils can range from sands to clay loams depending upon the parent material. The soils both at the site and in the vicinity are typical of the description presented above.

## Modern Climate

Climatically the area has a semi-arid continental climate with warm summers and cool winters. Few climatic data are specifically available for the study area and data from nearby Lovelock and Winnemucca have been used to fill this void. Precipitation occurs mainly in the form of winter snow and spring rain while in the summer a small percentage falls during showers and thunderstorms in July and August.

The mean temperatures for nearby stations range from a mean maximum of $72^{o}$-$73^{o}$ F ($22.2^{o}$-$22.8^{o}$ C) to a mean minimum of $28^{o}$-$29^{0}$ F ($-2.2^{o}$-$-1.6^{o}$ C).

The low precipitation totals in the study area are largely the result of the rainshadow effect of the Sierra Nevadas to the west and intervening mountain ranges that effectively reduce the moisture of inland moving Pacific Ocean storms during the fall, winter and spring. The Stillwater and East Ranges also provide a local rainshadow effect. The average annual precipitation is approximately 4.79 inches at Lovelock (12.2 cm) and 8.20 inches at Winnemucca (22.4 cm) on the valley floors and upper bajadas and varies with elevation with some of the higher mountain ranges receiving in excess of 25.0 inches (63.5 cm) annually. Snowfall in the area is generally light. Relative humidity in the area is generally low due to the low rainfall and generally warm temperatures. Evaporation is high during the warm summer months.

Data on wind velocity are non-existent for the area but generally the winds are light to moderate. Strong winds occasionally accompany local thunderstorms in July and August or active frontal systems in fall, winter and spring. The winds are usually from the south or north due to the general relief of the surrounding mountain ranges.

## HOLOCENE ENVIRONMENTAL CHANGE

During the past thirty years there has been a continuing debate among students of Great Basin prehistory as to the cultural significance of post-glacial climatic change (Antevs 1948, 1955, Aschmann 1958, Baumhoff and Heizer 1965, Bryan and Gruhn 1964, Jennings 1957, Martin 1963, Swanson 1966, Fowler 1972, 1977, Elston (ed.) 1976 among others). One basic unresolved issue is the validity of Antev's three part model of climatic change and its cultural effects. Various paleoecological studies have been undertaken throughout the Basin with either indirect or direct emphasis on determination of the chronological boundaries of the climatic subdivisions proposed by Antevs: the postulated effects of climatic change, both cultural and ecological; regional and local variations in chronology and effect, etc.. Mehringer (1977) had admirably summarized these studies (based on both geological and biological evidence) and has proposed a regional synthesis although he cautions against the acceptance of paleoclimatic models which claim relevance for the Great Basin as a whole. Fowler (1972) has discussed the climatic chronology and Baumhoff and Heizer (1965) have reviewed its perceived effect on man.

The paleoecological data for the Painted Cave area is extremely limited and studies dealing with Holocene climatic change and effects are few in number.

To the east in the Toquima Mountains in the vicinity of the Big Smokey and Monitor Valleys, Kautz and Thomas (1972) have reported on the palynological investigations of two cave middens from Toquima Cave and Gatecliff Shelter. The results obtained are rather inconclusive but they suggest the possibility of a gradual replacement of a relatively dessicated woodland-savannah by a more mesic pinyon-juniper woodland about 3400 B.P. This shift corresponds quite closely to the conventional Holocene climatic sequence proposed by Antevs (1948, 1955) of a shift from a warm dry Altithermal climate to a cooler, moister Medithermal.

To the west in the Lovelock area, Byrne, Busby and Heizer (In press) have reported on a palynological analysis of the sediments from Leonard Rockshelter. One pollen diagram represents the last seven thousand years and includes a prominent Pine-Cheno/Am-Pine oscillation. The pine minimum is estimated to date from 6000 B.P. to 4000 B.P. and has been interpreted to be a reflection of local changes in climate, or, more specifically, changing lake levels in the Humboldt Sink. The data from Leonard generally confirms Antevs interpretation of the site's stratigraphy and in the broader sense, his three part reconstruction of the Holocene climate. Unfortunately the pollen record does not provide an accurate estimate of the magnitude of climatic change. The Altithermal climate may not have been very different from that of the present but it was different enough to cause the dessication of the Humboldt Sink and in this respect it must have had a major impact on prehistoric subsistence and settlement patterns.

More research on Holocene climatic change and its ecological/cultural consequences is currently ongoing in all regions of western North America. The point to be made in discussing Holocene environmental change is that small changes in climate can have major environmental consequences as the recent history of the post-pluvial lakes in the Great Basin indicates. For the study area, it is highly likely that the small changes in climate, as indicated in the palynological record, had a major effect on environment and hence subsistence. In the case of Painted Cave, a late Medithermal archaeological site, the vegetation and faunal patterns were undoubtedly similar to those of the present during its occupation. More research is needed, however, to determine the significance of postglacial climatic change, both for the study area in specific and the Great Basin in general.

## ETHNOGRAPHIC AND ARCHAEOLOGICAL OVERVIEW

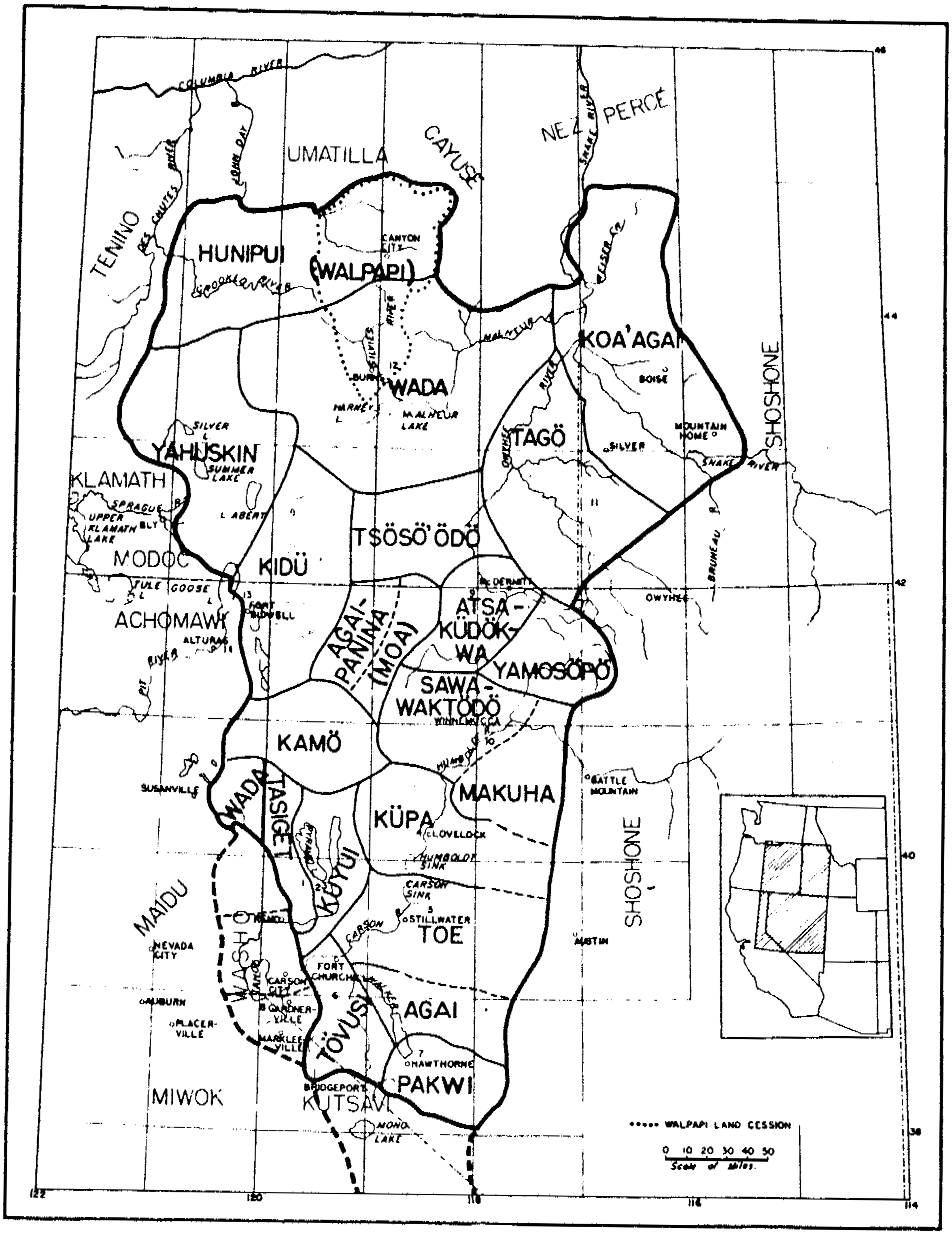
The following summaries are included to provide the ethnographic and archaeological background for the study area. Ethnographic data from the existing literature are used to identify the aboriginal territorial boundaries of the groups occupying the region and to provide an ethnographic context for archaeological interpretation. The data and the references presented below, while not extensive and only briefly summarized, are provided primarily for background information and to form a framework in which to place the archaeolgical evidence recovered from the test excavations at Painted Cave.

## The Ethnographic Record

The study area appears to have been held by the Northern Paiute and Shoshone groups (Steward 1937, 1938, Steward and Wheeler-Voegelin 1974, and Stewart 1939, 1966). Stewart (1939) has attributed the area to the Makuhadökadö (?) or Pauida tuviwarai (?) of Battle Mountain and the mountains west of the Reese River (Map 4). The Makuha band occupied 2500 square miles (6475 $km^2$) with their territory comprising part of the Humboldt Valley, Buena Vista, Pleasant and the Buffalo Valleys, and the Sonomas and East Mountains. No population estimates are given by Stewart and information on the band came from members of neighboring groups since no Makuha informants were known at the time of the research.

Steward and Wheeler-Voegelin (1974) dispute Stewart's claims of a Paiute occupancy of the area. Their research, conducted for the Indian Lands Claim Commission hearings, marshalls both ethnographic and ethno-historical evidence to indicate that the area was primarily occupied by either Shoshone groups or by both groups. At present, based on the available data, it is safe to assume that the area was probably occupied or used by both the Shoshone and Paiute and can be viewed as a transitional zone between the two.

In general the aboriginal groups in the study area followed a hunting/gathering economy based on the utilization of various plant resources (esp. seeds and pinyon nuts) and the hunting of various small to large mammals (esp. rabbits, deer, antelope and bighorn sheep). Steward (1938, 1941) and Stewart (1941) present various lists and discussions on resource utilization. Special note should be made of the "Lacustrine Adaptation" in the surrounding areas (cf. Napton 1969, 1970, and Heizer and Napton 1970) based on the exploitation of fresh water marsh and lake resources as contrasted to the "Desert Adaptation".




(from Stewart 1939)

Map 4

The hunting/gathering lifeway of the Shoshone groups (and by extension all Great Basin groups) has been described and discussed by Steward (1938, 1955, 1970), summarized in numerous doctoral dissertations on the Great Basin (cf. Thomas 1971a) and discussed in many papers (Thomas 1971b, 1972a,b, 1973a, Davis 1963, Bettinger 1975 among others). It will not be discussed in this report although references to the "Shoshone Lifeway" will refer to the general patterns discussed in previously cited works.

Previous Archaeological Research

Archaeological research in the immediate area of Painted Cave has been limited to several cultural resource clearance reports (cf. Roney 1975, 1977). While the archaeological resources of this area have been neglected, an impressive body of data and research is available for the surrounding areas. To the east, David H. Thomas of the American Museum of Natural History has been conducting long term excavations and survey activities in the Reese River and Monitor Valleys (cf. Thomas 1969, 1970, 1971a,b,c,d,e, 1972a, 1973, 1974, Thomas and McKee 1974, Thomas and Thomas 1972, and Thomas and Bettinger 1976). A tentative chronology for central Nevada has been developed based on this research (cf. Thomas and Bettinger 1976) and Table I. Work in the Grass Valley vicinity to the northeast of the Reese River Valley has been done by C. W. Clewlow and R. Ambro and a general chronology established (cf. Clewlow and Pastron 1972, Clewlow, Ambro and Pastron 1972, and Ambro 1972, cf. Table 2).

To the south in the Edwards Creek Valley, Wagon Jack Shelter (Heizer and Baumhoff 1961) and Eastgate Cave (Elsasser and Prince 1961) have been reported on (cf. Hester 1973 for a summary and discussion). The Humboldt and Carson Sink areas to the west have been the focus of archaeological investigations since the early 1900's (Baumhoff 1958, Ambro 1966, Clewlow 1968, Clewlow and Napton 1970, Cowan and Clewlow 1968, Grosscup 1956, 1960, Heizer 1951, Heizer and Krieger 1956, Heizer and Clewlow 1968, Heizer and Napton 1970, Kobori 1976, Loud and Harrington 1929, Napton 1971, Nissen 1971, Roust 1966, Roust and Clewlow 1968, Roust and Grosscup 1957, Stanley, Page and Shutler 1970, Tuohy 1969, Wheeler and Wheeler 1969, Byrne, Busby and Heizer, In press, among others. Hester (1973) has admirably summarized the research conducted in the western Great Basin and should be consulted for an overall chronological ordering and synthesis of the area.

TABLE I

Central Great Basin Chronology

| | |
|---|---|
| Yankee Blade Phase | A.D. 1300 - historic |
| Underdown Phase | A.D. 500 - 1300 |
| Reveille Phase | 1500 B.C. - A.D. 500 |
| Devils Gate Phase | 3000 B.C. - 1500 B.C. |

TABLE 2

Grass Valley Chronology

| | |
|---|---|
| Late Prehistoric/Protohistoric | A.D. 1000 - A.D. 1860 |
| Middle Prehistoric | 2500 B.C. - A.D. 1200 (Medithermal - Elko, Eastgate, Rose Spring and Humboldt points) |
| Early Prehistoric | Anathermal - 'Large concave base', Angostura-like and Humboldt Concave Base A points |

## EXCAVATION STRATEGY AND METHODOLOGY

The excavation was organized according to a north-south grid, oriented on magnetic north and based on a datum stake set on the apron in front of the shelter mouth (Map 3). A vertical datum of 0.00 m elevation was assigned to the datum stake (cf. Table 3 for other selected stake elevations). Two meter units or 'pits' were set up and designated on the grid system using the southeast corner stake as control. Initial excavation within the grid units was in 10 cm arbitrary levels because of the unknown nature of the deposit. An initial attempt to follow the natural stratigraphy was a failure in S6E6 as rodent burrows and other miscellaneous intrusions (shallow nests, firehearths, cow wallowing, etc.) had badly disturbed the sediments. Continuing excavation utilized arbitrary 10 cm levels because of the unknown nature of the strata and natural disturbance of the deposit. Excavation by natural stratigraphy was used however during the excavation of the Alluvium 2

(Stratum F), the vegetation layer (G) and occupation floor (H) in S6E4 (cf. Stratigraphy Section for details and descriptions).

All depth measurements were taken from below surface (BS) at the northwest corner stake of each unit. The excavated fill for S6E6 was passed through one-eigth inch mesh screen while S6E4 was screened using one-quarter inch mesh. Standard excavation records were kept.[1]

Excavation in each two meter unit proceeded on a quadrant basis for more precise horizontal and vertical control (Fig. 4). That is, if an artifact was overlooked during the trowelling process and recovered in the screen it could be located with a little more precision than noting that it came from unit S6E6. Instead, the item could be designated as coming from the NW¼, or SE¼ etc. of S6E6. This procedure may perhaps be of some utility in excavations utilizing two meter, or larger, excavation units.

The units chosen for excavation (S6E6 and S6E4) were selected because of their relative position to the badly vandalized areas allowing for easy access and a check on stratigraphy, their protected location inside the shelter proper, and their relatively 'undisturbed' surface appearance (Map 3). All units were trowel excavated until culturally sterile alluvium was encountered (at a depth of 70 cm). It is estimated that ca. 3.5 $m^3$ of fill was removed from the two units and approximately 5.0% of the main occupation area of the site professionally excavated (regardless of vandalized areas).

The site was backfilled upon completion of our excavations. Prior to backfilling, the sidewalls and floor areas were lined with plastic sheeting to protect the units and to act as a guide for any future excavators. The datum stake, N0E0, and two other points (S4W12 and S8W12) along a north-south line were set in concrete and covered so as to render them unobtrusive and protect them from any future vandalism.

## DATA RECOVERY METHODS/SAMPLE COLLECTION PROCEDURES

### Field Procedures

The excavation of the two test units was accomplished by use of the trowel and dustpan method of excavation with the fill first being carefully trowelled into a dustpan; inspected by the excavator; dumped into a #10 bucket; and finally screened through a 1/8" or 1/4" mesh rocker screen by a 2 or 3 man screening crew. When necessary, whisk brooms or small camel-hair

Figure 5: View of occupation floor and use of paintbrush in exposing of floor (#3.28).

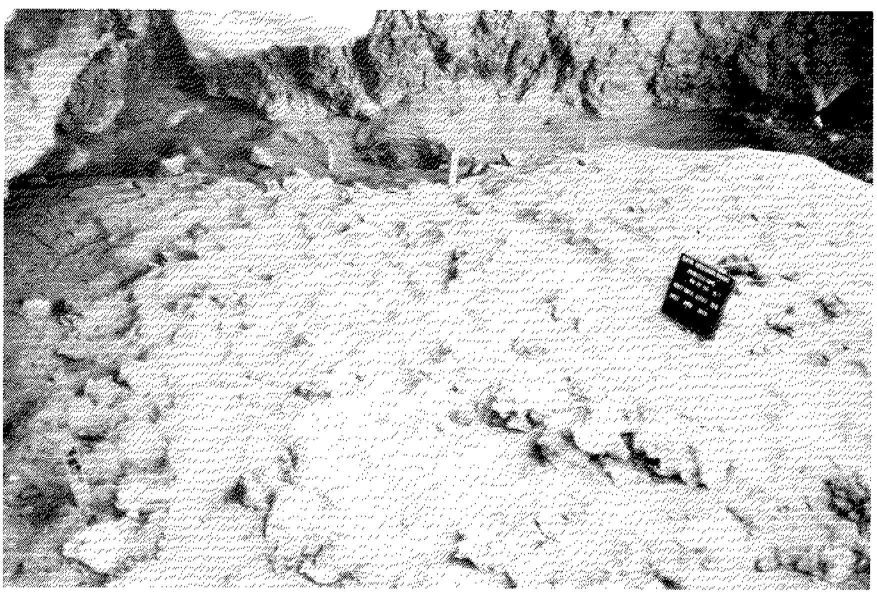


Figure 6: View of surface of site prior to excavation showing vandalism and disturbance (#1.8).

paintbrushes were used to expose cultural items _in situ_ or for cleaning purposes (cf. Fig. 5).

Table 3

Selected Stake Elevations for Painted Cave, NV Pe 40

(cf. Map 3)

Datum - assumed elevation of 0.00 m

| | | |
|---|---|---|
| S2E2 - +0.53 m | S4E4 - +0.36 m | S4E0 - +0.32 m |
| S4E2 - +0.56 m | S2E4 - +0.35 m | S2E0 - +0.41 m |
| S0E2 - +0.29 m | S0E4 - +0.47 m | S4W2 - +0.08 m |
| S6E2 - -0.01 m | S0E6 - +0.28 m | S4W6 - -0.61 m |
| S8E2 - -0.24 m | S0E8 - +0.09 m | S4W12- -1.69 m |
| | N4E8 - +0.89 m | S8W12- -1.14 m |
| | N4E0 - -0.84 m | S6E6 - +0.34 cm |
| | Stream bank - -1.78 m | S8E4 - -0.24 cm |
| | | S6E4 - +0.24 cm |
| | | S4E6 - +0.18 cm |

All determinations made with hand level, line level and stadia rod.

1. Notes and excavation records are on file at the Lowie Museum of Anthropology and at the Bureau of Land Management, Winnemucca District Office, Nevada.

Each unit was excavated by arbitrary 10 cm levels and by quadrant to insure more precise horizontal and vertical control. Therefore only one quadrant of a particular level was excavated at a time. Soil samples of approximately 2-5 lbs (1.5-3.8 kg) in weight were taken from random surface localities of each level prior to quadrant excavation where necessary. Macrobotanical specimens, faunal remains and lithic debitage were each assigned a separate collection bag and specimens recovered either during the trowelling or screening operations were placed in the appropriate bag. Each bag was labelled by site, unit, quadrant, level, depth, item, field catalogue number, date, etc. for recordation purposes. In addition, a special information tag with the same information was included inside the bag in case of any accidents. Artifacts were handled in the same fashion except that each item was identified and assigned a separate field catalogue number. All artifacts (e.g. projectile points, biface fragments, retouched flakes, etc.) were placed in a common Level Bag for safeguarding. Notes were made on each find in the field notebook by the recorder and supervisor. It must be pointed out that all cultural materials (i.e. lithic debitage, faunal remains, macrobotanical specimens) were collected by hand from the screens and retained. In brief, every effort was made to insure that all cultural materials were recovered for any future analysis.

Radiocarbon samples (charcoal) were collected both from *in situ* hearths (see Firehearths section) and the screen. Samples were packaged in aluminum foil to avoid contamination and handled as artifacts for recordation purposes.

Several whole sediment samples were also collected from unit S6E6. These consisted of two No. 10 buckets of deposit that were obtained for future flotation or fine dry screening/separation in the laboratory.

Sediment samples of approximately 1.0 lbs (500 g) were collected from each stratum of the profiled sidewalls (see Stratigraphy Descriptions). If funds are ever available the samples will be forwarded to a soil scientist for standard soil determinations and tests (cf. Sandor 1978). Again, detailed records were kept on each sample.

Pollen samples were collected in the same manner as the sediment samples except a 20 dram vial was filled with material for the palynologist. Every effort was made to avoid contamination of the samples.

Each sample was given a field catalogue number (FC#) in the field for recordation purposes. These numbers were converted to permanent Lowie Museum of Anthropology, University of California, Berkeley numbers when the final catalogue was prepared. Therefore it is possible to cross check an item by both its field number and its permanent LMA number. All original field notes, photographs, catalogue sheets have been filed in the Lowie Museum of Anthropology Archives for future researchers.

## Laboratory Procedures

Once back from the field the items were washed and assigned their permanent LMA numbers. Numbers were either written directly on the specimen in India ink and covered with a protective laquer coat or were written on the container in which the item was placed. Soil samples were air dried and rebagged in plastic for protection. Each item was bagged in plastic press-to-seal bags to prevent any damage during storage. Analysis proceeded directly from this point and the various analytical procedures are detailed in their respective sections of this report.

## THE DEPOSITS - GENERAL

The deposits at Painted Cave are characterized by an elemental accumulation of aeolian-derived dust and roof fall, organic remains (ash, charcoal, cattle feces, and vegetal material) and culturally derived materials partially mixed with and lying upon discrete layers of alluvium. Evidence of small rodent burrows were found throughout the deposit. Rodent burrowing and pothunter distrubance pits were extensive in the upper half of the deposit (Fig. 6 and 7). Several hearth areas, the remains of single and multiple fires, were encountered in both excavated units. One hearth is associated with a living floor (see Hearths for detailed discussion). The deposit was excavated to a maximum depth of 70 cm and the bedrock base of the site was not encountered. The deposit was dry throughout and several natural stratigraphic layers were discernable although badly disturbed (see Excavation Strategy). The stratigraphy of Painted Cave is presented below.

### Stratigraphic Descriptions (Fig. 8 - 11)

The description of the strata is divided into two parts. Strata A through E are discussed under "Disturbed Strata". This corresponds approximately to the upper half of the deposit. The relatively undisturbed strata, F through H are treated separately.

### Disturbed Strata

Stratum A: (Munsell 10YR 6/3, dry, pale brown) The present surface of the modern floor of the shelter is covered with lithic debitage, rock fall ranging from pebble to boulder size from the ceiling and burnt *Bos* bones and feces. Other small mammal remains are also present. The stratum is a very fine, light brown sediment (part alluvium and part aeolian dust) and represents the 'backdirt' from previous unauthorized "excavations". The sediment is mixed with vegetal material (twigs, bark, etc.). The boundary between stratum

A and the "cow feces layer" is abrupt and smooth while the boundary between stratum A and stratum B is similarly abrupt and smooth.

"Cow Feces Layer": (Munsell 10YR 4/2, dry ) This is a hard layer of cattle feces directly underlying stratum A. The boundary between this cow feces layer and stratum D is abrupt and varies from smooth to wavy.

Stratum B: (Munsell 10YR 6/3, dry) This is a layer of fine pale brown alluvium. Its distribution is discontinuous and could not be traced throughout the deposit. Where present (south wall S6E6 and S6E4) stratum B is most often directly below stratum A and above stratum C. The boundary between B and C is abrupt and smooth to wavy. In certain areas stratum B overlies stratum D and this boundary is wavy and abrupt.

Stratum C: (Munsell 10YR 5/2, dry) This badly disturbed layer is visible only in the south wall profile of S6E6 and S6E4 (Fig. 9). It is a mixture of dry, loose, noncoherent fine alluvium, organic material (bone, twigs and feces), small angular roof fall, and ash. Its boundary with the underlying stratum D is abrupt and smooth to wavy.

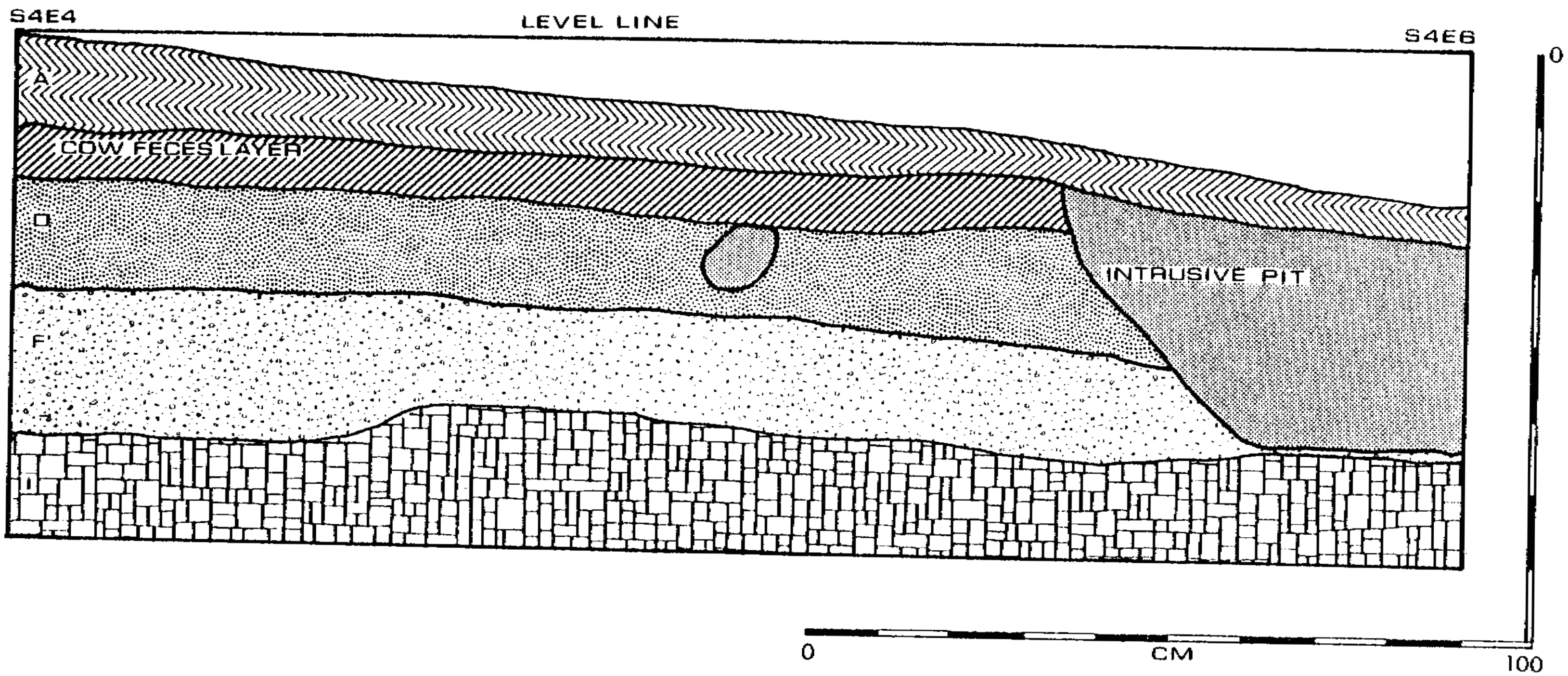
Stratum D: (Munsell 10YR 4/2, dry) This is a disturbed layer of mixed, loose ash, charcoal fragments/flecks, fine aeolian dust, and organic material (bones, twigs, etc.). An ashy lens is present within this stratum. Various stained areas probably resulting from burning and heating of the sediment are particularly visible in the south wall of S6E6 and S6E4 (Fig. 9). Rodent burrows are common throughout this stratum. Displaced "chunks" of Alluvium 1 (stratum B) and Alluvium 2 (stratum F) occur within stratum D. Throughout most of the deposit stratum D underlies the "Cow Feces Layer" and is above stratum F. The boundary between D and F is abrupt and smooth. The boundary between D and E, as seen in the south wall of S6E4, is abrupt and smooth.

Stratum E: (Munsell 10YR 4/2, dry, dark grayish brown) This is a fine charcoal stained sediment with a concentration of charcoal present. This stratum is present only in the south wall of S6E6 and S6E4 (Fig. 9). Stratum E is found between strata D and F. The distribution is limited to the western half of the south wall of S6E6 and S6E4 where it has been disturbed by various rodent burrows. Its boundary with stratum F is abrupt and smooth.

Undisturbed Strata

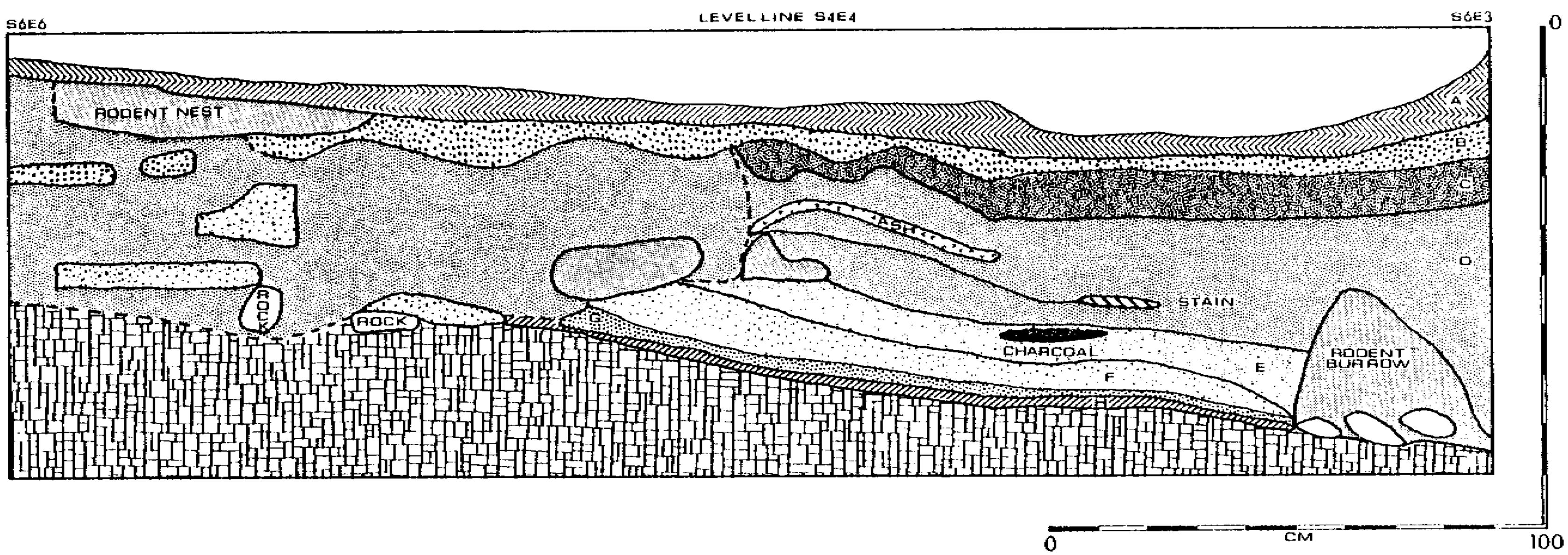
Stratum F: (Munsell 10YR 7/3, dry) This is a very pale brown fine alluvium with a continuous distribution (i.e. it is present in every side wall profile). Throughout most of the deposit the alluvium is directly beneath stratum D. In the upper one-third of the alluvium layer there is a thin charcoal lens. This lens is not directly associated with any cultural materials. The mere presence of this sharply defined, but thin lens would indicate the alluvium layer is not the result of a single episode of deposition but rather a series of innundations. Whether the charcoal lens represents cultural occupation or a natural fire could not be determined. The west wall profile of S6E6 (Fig. 10) shows this stratum divided into F-1 and F-2. F-1 indicates discolored alluvium while F-2 is discolored alluvium of a slightly different hue. Both F-1 and F-2 merge with the rest of stratum F. Rodent burrows make the exact boundary with the 'un-colored' portions of the alluvium difficult to determine. Except for the upper one-third of the layer, the alluvium is culturally sterile. Directly below this stratum is the Vegetation Layer (stratum G). The boundary between these two is abrupt and varies from smooth to wavy. The alluvium layer varies in depth such that in portions of the deposit it is at the same level as stratum H - the living floor. The Vegetation Layer is not present in these cases.

Stratum G: (Munsell 10YR 4/2, dry, dark grayish brown) This discontinuous vegetation layer ranges in thickness from a maximum of 5.0-8.0 cm to a minimum of 1.0 cm. It is not present in the north and east portions of S6E6 and its presence is associated with the limited areal extent of the living floor and hearth (stratum H). This partially decomposed layer of twigs and bark (*Artemisia sp.*, *Sarcobatus sp.* ?) is directly on top of the living floor and hearth. The boundary between the vegetation layer and living floor is abrupt and smooth. The limited areal extent of the vegetation leads to the conclusion that it was purposefully placed on the living floor. The initial flooding and introduction of the overlying stratum F probably displaced the upper portion of the vegetation layer to some degree. Thus any occupational refuse that may have been present on the original undisturbed vegetation layer was undoubtedly shifted from its original position. This hypothesized movement is substantiated by the very thin vegetation layer found over the hearth area which is directly associated with the living floor. Where the



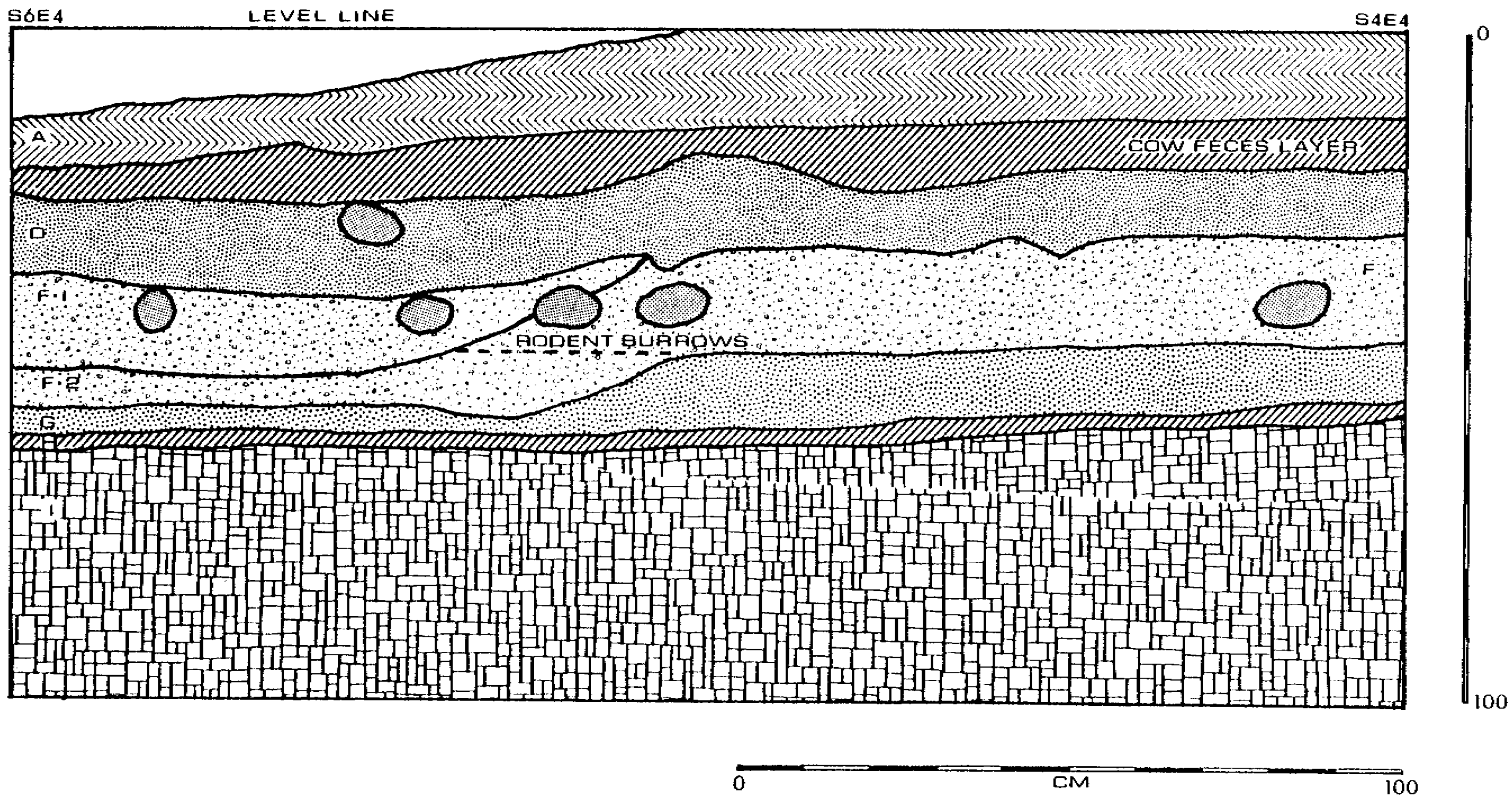

PAINTED CAVE - NORTH WALL PROFILE - S 6 E 6

Figure 8



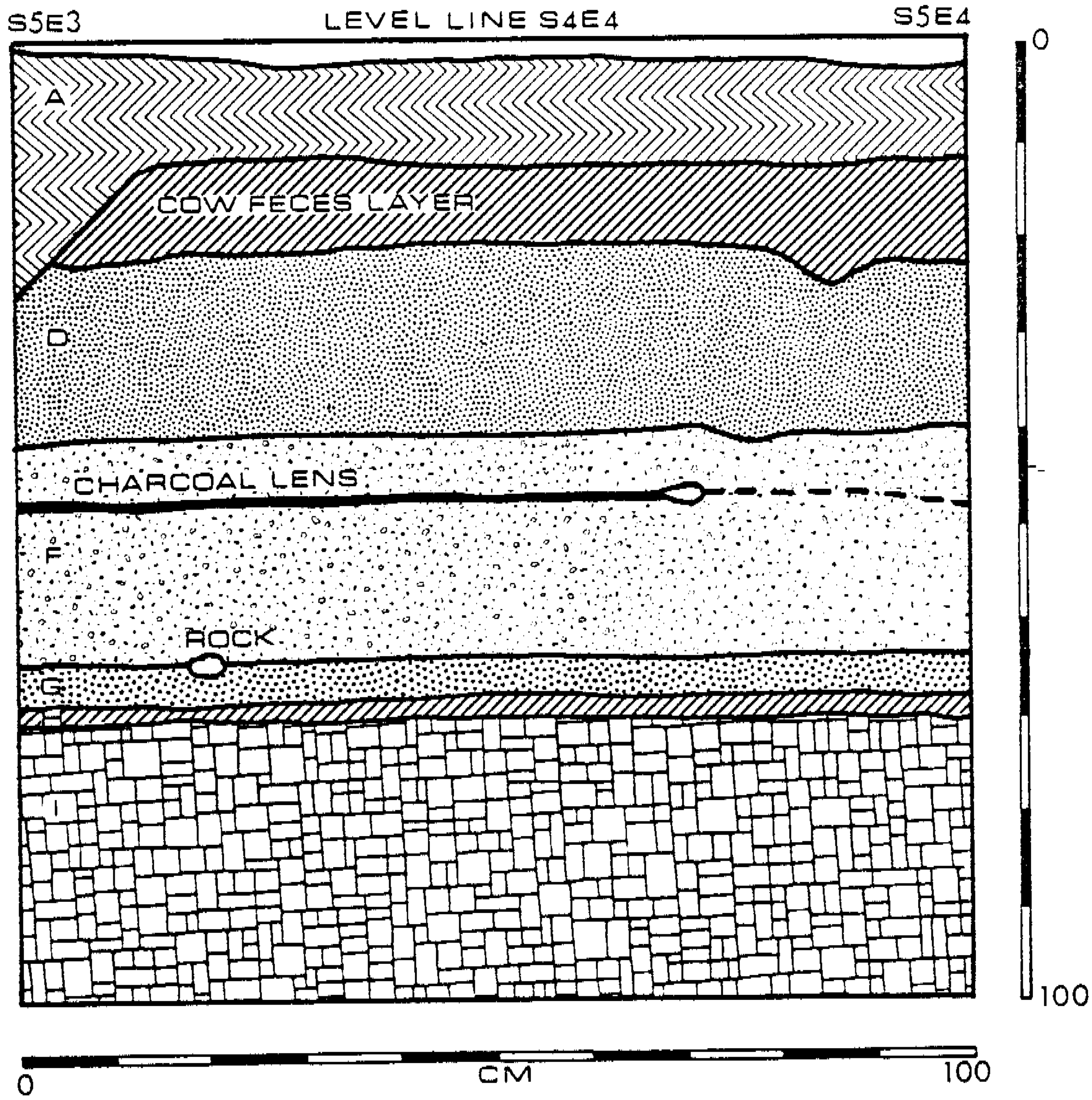

PAINTED CAVE - SOUTH WALL PROFILE - S 6 E 6 / S 6 E 4

Figure 9




PAINTED CAVE - WEST WALL PROFILE - S 6, E 6

Figure 10




PAINTED CAVE - NORTH WALL PROFILE - S 6 E 4

Figure 11

vegetation layer and the associated living floor (stratum H) are not present, stratum F dips down to actually meet with the unexcavated stratum I. Thus, strata G and H represent a period of site utilization between episodes of alluvial deposition.

Stratum H: (Munsell 2.5Y 8/2, dry, White) This fine, dry and very hard alluvium has been compacted and cracked by both site utilization and dessication/occupation. This living floor has a limited areal distribution as uncovered during the excavation - the western half of S6E6 and its associated hearth in S6E4. The floor is stained reddish yellow directly to the east of the hearth (Munsell 7.5YR 7/6, dry). The grayish brown hearth (2.5YR 5/2, dry) had very little charcoal present. Where the floor-hearth is not present a light gray alluvium (2.5Y 7/2, dry) meets the edge of the floor.

FIREHEARTHS

Several distinct firehearths and 'ashy' concentrations that continued intermittently downwards to an 'occupation floor' were exposed during the excavation of Painted Cave. While several discrete hearth areas were noted, the majority of the ash and charcoal concentrations were indistinct (i.e. had no definite boundaries of significant depth) probably due to the mixing of the deposit by both natural and cultural means (Figs. 12 and 13). Dimensions of several of the noted hearths could not be determined due to their intrusion into unexcavated portions of the site. Firecracked rocks were not common in the deposit.

One hearth was noted with a fire cracked rock border or 'ring' in S6E6, SW ¼ at a depth of 39-40 cm BS with dimensions of 30 cm x 25 cm. Charcoal fragments from this hearth have been submitted to the Radiocarbon Laboratory, University of California, Los Angeles for dating.

One additional hearth, whose dimensions could not be determined, consisting of charcoal stained soil, ash and small charcoal flecks was uncovered in S6E6, NW¼, SE¼, N½ of SW¼, 15-30 cm BS. From inspection it was determined that the hearth was intrusive and probably represents the remains of an historic use.

Two hearths were noted in unit S6E4. One consisted of ash and small fragments of charcoal directly on one of the alluvial surfaces 40-50 cm BS. This hearth covered most of the exposed area of this unit (SE¼) (cf. Fig. 11). No dimensions could be determined. The other indeterminate hearth was

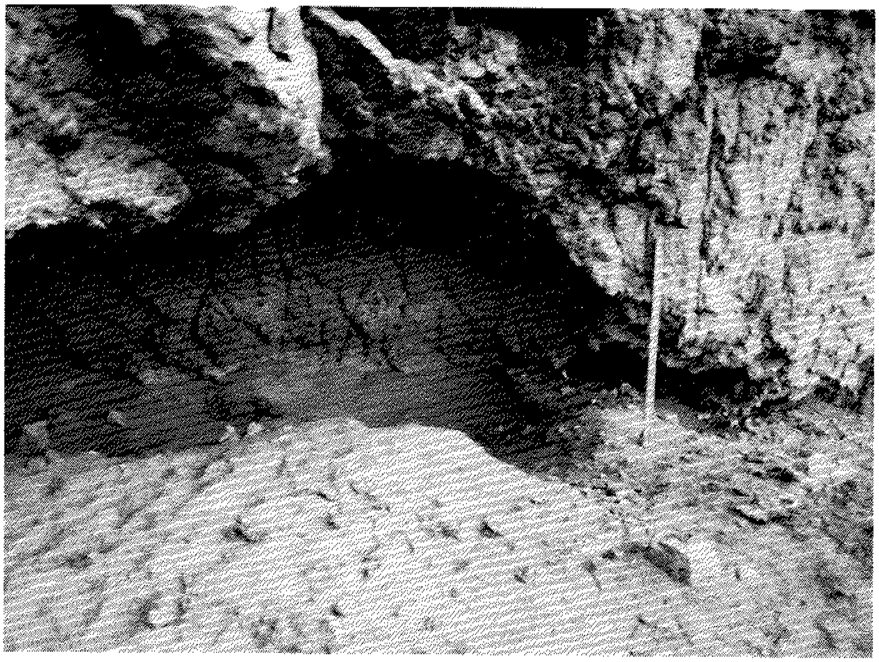


Figure 7: View of vandalism prior to excavation (#8.4A).

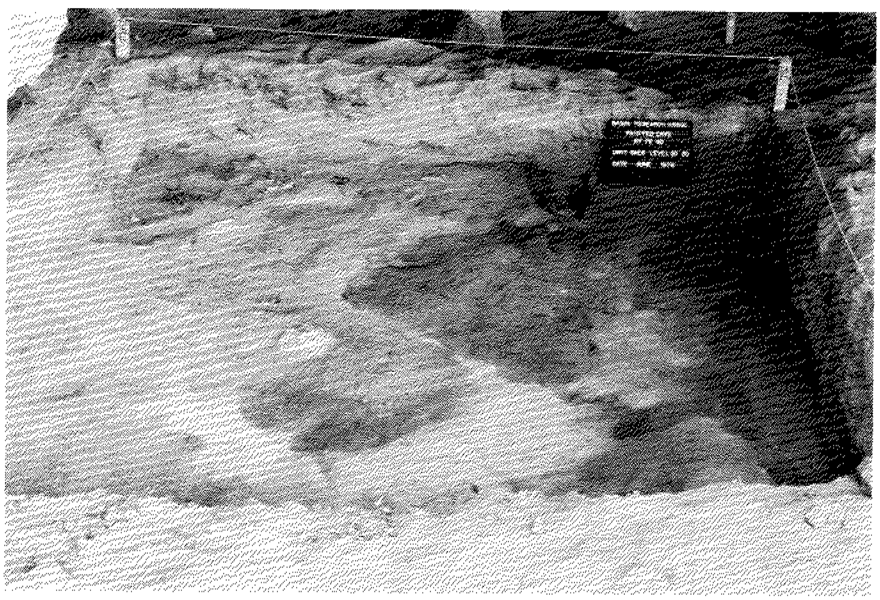


Figure 12: View of S6E6, Level 20-30 cm illustrating rodent disturbance and indistinct hearth/ash areas (#3.1).

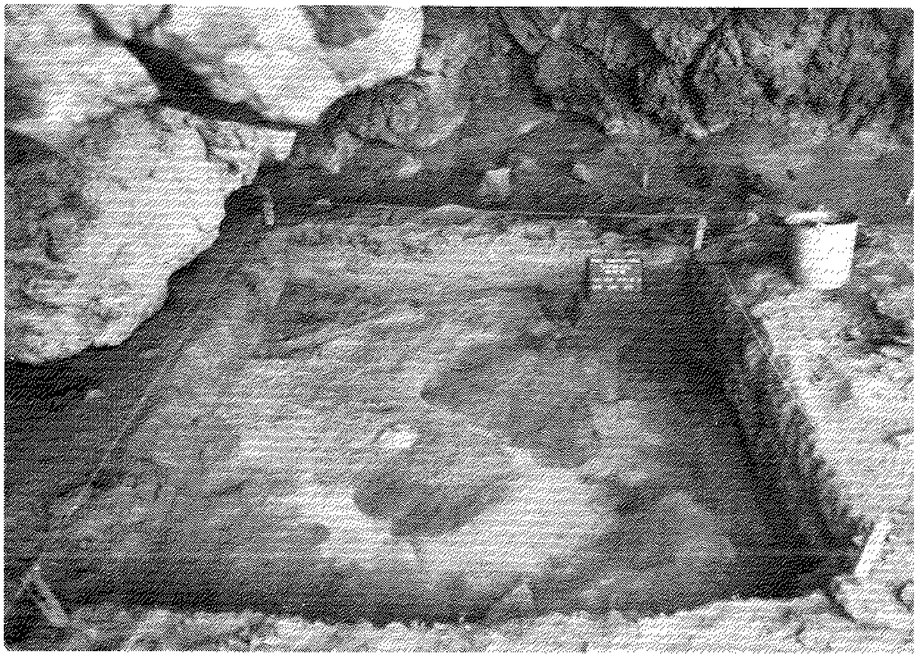


Figure 13: View of S6E6, Level 20-30 cm illustrating rodent disturbance and indistinct hearth/ ash areas (#8.25).

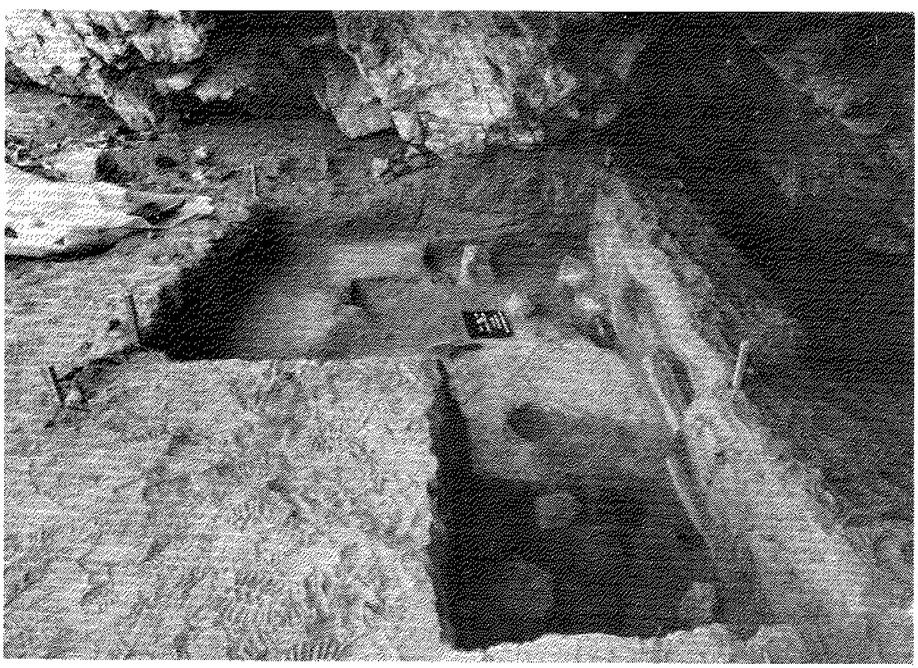


Figure 14: Overall view of S6E6, S6E4 (#7.36).

located 61 cm BS on the 'occupation floor' extending into S6E4 from S6E6 (cf. Fig. 14). Charcoal from both hearths has been submitted for dating to the University of California, Los Angeles.

Examination of some of the charcoal fragments has tentatively identified one of the fuel sources as *Sarcobatus sp*. Undoubtedly other local woody vegetation was also used.

In summary, scattered ash, charcoal and fire stained sediments along with several discrete hearths were noted during the excavation of Painted Cave. The majority of these are undoubtedly single use (perhaps multiple) hearths formed during a brief seasonal occupation of the site. The majority of the recovered cultural materials were concentrated in the immediate or close vicinity of the hearth areas.

RADIOCARBON DATES (See Appendix VII)

Three charcoal samples were submitted to the Radiocarbon Laboratory at the University of California, Los Angeles for dating. The samples forwarded to the UCLA lab are described below (see Firehearths for additional information).

Sample 2-61877: Small fragments of charcoal from a hearth. Located in S6E6 at a depth of 39-40 cm BS, the hearth consisted of a rough ring or pile of firecracked rock.

Sample 2-61937: Fragments of charcoal from a hearth lying directly on top of one of the alluvial surfaces (stratum F). The hearth is in S6E4 in the NE¼ of the SW¼ of the unit at a depth of 40-50 cm BS. This hearth appeared to cover most of the exposed area of the unit.

Sample 2-61946: This sample consisted of charcoal from a hearth directly associated with a hard packed living floor (stratum H). Located in S6E4 the hearth was at a depth of 61 cm BS.

Determination of the ages of the three hearths will provide chronological control for the site; contribute temporal boundaries for the recovered projectile points; provide some chronological control for the numerous pictographs present; and perhaps provide a time frame for the alluvial deposition sequences present at Painted Cave. The results of these radiocarbon analyses will be provided when available, along with a statement on their utility in the interpretation of the site (See Appendix VII).

FEATURES

One feature was noted during the excavation of Painted Cave. This is a hard packed alluvial surface utilized as an occupation/living floor with a cultural layer of twigs, grass and other miscellaneous vegetal material placed on its surface by the aboriginal occupants (cf. Fig. 10). This vegetal layer lenses out and thins towards the east and is not present in the east wall. During excavation this compacted vegetation peeled readily away from the alluvial floor allowing for excavation by natural stratigraphy. The floor extends roughly out into the center of S6E6. This boundary correlates with the overhang of the shelter formation. Playa-like cracking is apparent over much of the surface of the floor suggesting a drying of the floor prior to occupation and the addition of the vegetal covering (Figs. 15-17).

The remnants of a hearth in the southwest corner of the excavated area have left the floor stained with charcoal and a reddish yellow color (7.5 YR 7/6, dry) (Fig. 16). Several circular to irregular depressions ranging from 2.8 cm to 16.0 cm in diameter and 4.0 cm to 8.0 cm in depth were present on the floor (Figs. 15-18). These depressions may be due to natural (e.g. rodent burrows) or cultural means (e.g. 'caches'). No cultural materials were present in the possible cache pits or depressions.

The living floor was apparently within the confines of a small brush (?) shelter constructed to enclose a portion of Painted Cave and protect the inhabitants from the elements - probably from the gusty winds present in Spring Creek Canyon. The large rocks present in the southeast corner of S6E6 may have either been deliberately placed (Figs. 15-17) by the aboriginal inhabitants or may be the result of a natural rockfall. In either case, they mark the eastern boundary of the occupation/living floor. As shown in Figs. 15-17, the occupation living floor is confined within S6E6, the eastern, northern and southern boundaries being visible in the photographs. The western extent of the living floor lies some unknown distance to the west in unexcavated portions of unit S6E4.

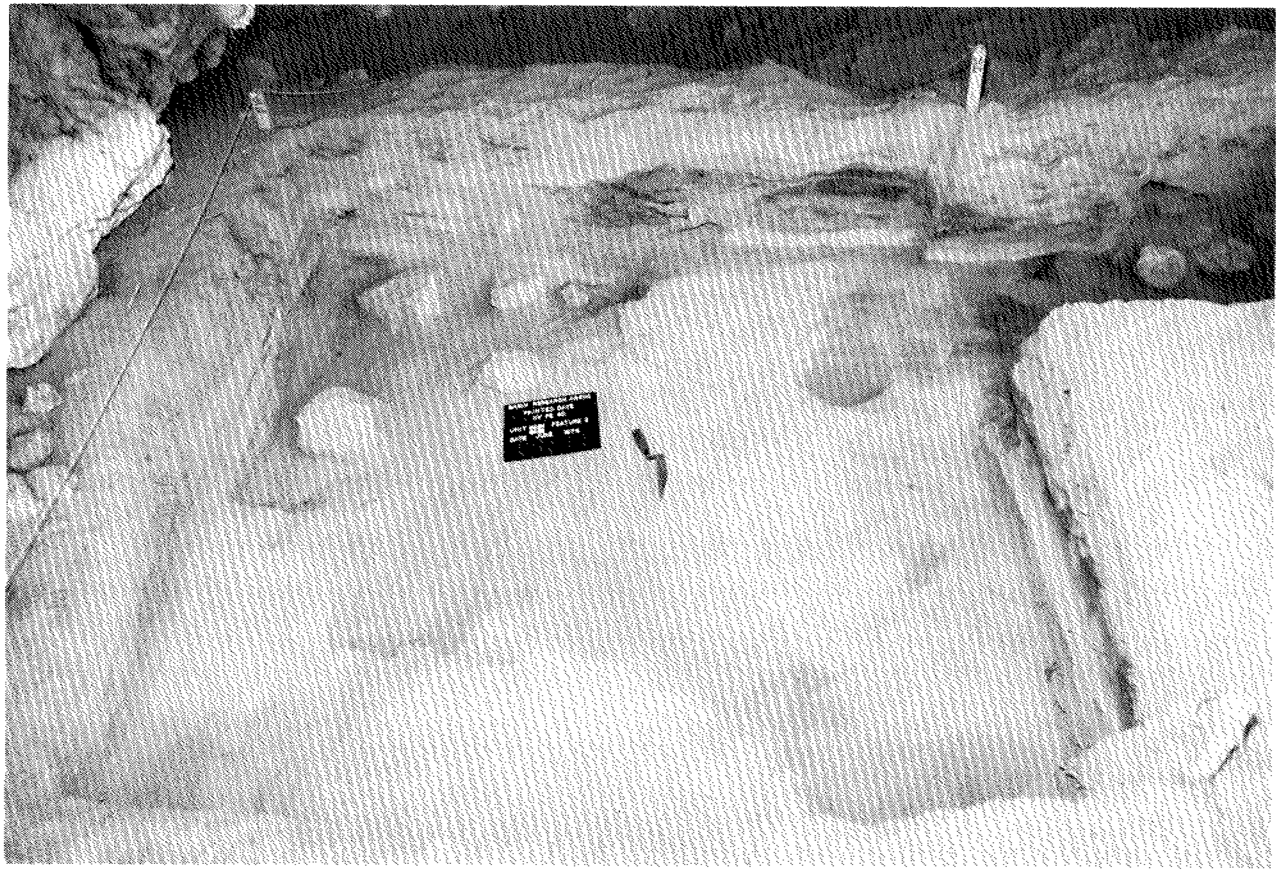


Figure 15:  View of completed excavation (#6.9).

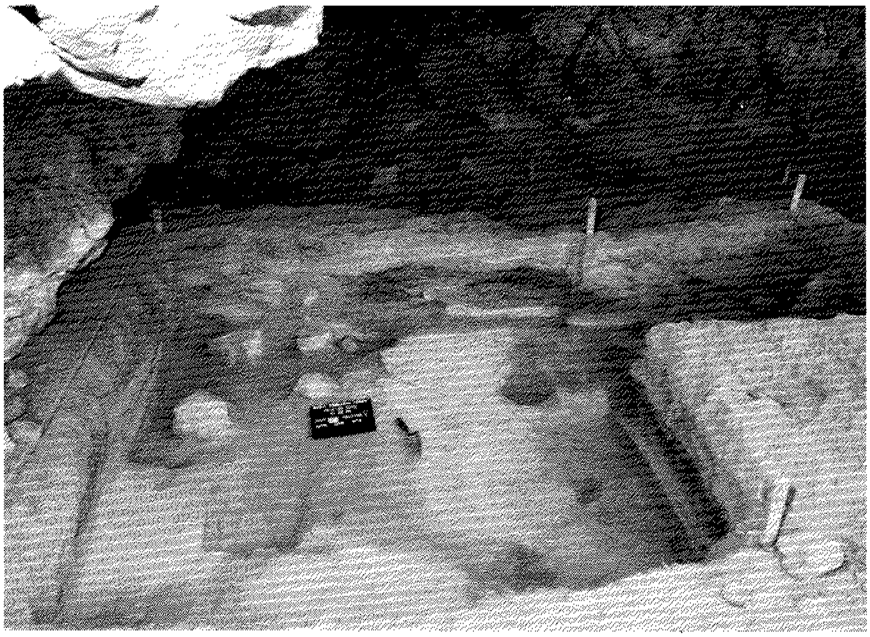


Figure 16: View of completed excavation (#7.35).

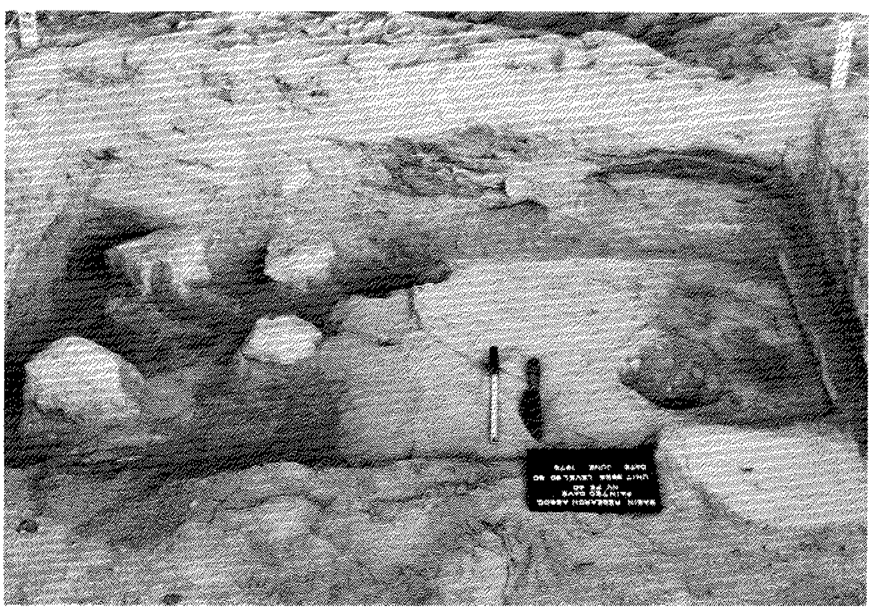


Figure 17: S6E6, Level 50-60 cm, view of floor, depression and playa-like cracking (#4.23).

Figure 18: View of alluvial floor, S6E4, Level 5 (#5.19A).

Ambro and Wallof (1972) have reported on Shoshone house types in Grass Valley (central Nevada), and other parts of the Great Basin. The occupation/living floor in Painted Cave best fits the "small structures with no depression" classification (cf. Ambro and Wallof 1972:113). This type of structure may have been small circular or semi-circular windbreaks or small domed or conical structures. Ethnographic examples of domed and conical houses without depressions are recorded for most areas of the Great Basin (cf. Steward 1941:233, 282-283; 1943:272, 305 and Stewart 1941:377, 430; 1942:256-257, 338). Great Basin 'houses' are also discussed by Cowan and Clewlow (1968), O'Connell and Ambro (1968), Clewlow, Ambro and Pastron (1972), Davis (1965) and O'Connell and Ericson (1974). Perhaps the most important project in this respect is the Gatecliff Archaeological Project where excavations at Gatecliff Shelter (NV-Ny-301) have revealed no less than 14 distinct occupation floors (D.H. Thomas, personal communication, 1978). The structure represented by the living floor in Painted Cave probably represents a linear or semi-circular wind break, arranged so as to take advantage of the shelter wall and roof for brush and pole support. Unfortunately the surface area and boundaries of the Painted Cave living floor could not be determined as only a portion of it was exposed during our excavations. Future excavation should expose the total floor area.

The exposure of this living floor is unique for a rockshelter in the Great Basin. The only other (currently) known living floors present in a cave or rockshelter are from Gatecliff Shelter in the Monitor Valley to the southeast. The presence of this floor coupled with the pictographs combines to add to the overall significance and National Register potential of Painted Cave.

## ARTIFACTS

A total of 69 artifacts were recovered from the excavated deposits of S6E6 and S6E4. Projectile points (17 specimens) and bifaces (16 specimens) account for almost half (48%) of the recovered artifacts, while pigment stones (ochre) (10 specimens) comprises another 14% of the artifact total. The next largest group of artifacts are the casually worked flakes, and edge damaged/utilized flakes (8 specimens) comprising 12% of the total. Formal artifacts - choppers, scrapers, sharp cutting edge tools, ground stone, etc. - are few in number and often are represented by only one recovered specimen (see Table 4). Not only were chipped stone artifacts few in number, but only one specimen of worked bone and two perishable artifacts were recovered. The majority of the artifacts were recovered from the Disturbed Strata (A, Cow Feces Layer, B, C, D, E) approximately surface to 40 cm BS (47 specimens, 67%). Five specimens (7%) were recovered from 40-50 cm BS (the relatively undisturbed parts of stratum F) while 17 specimens (26%) were recovered from 50-60 cm BS (the Undisturbed Strata, G and H). No artifacts were recovered from depths below 60 cm although fill from as deep as 70 cm BS was removed during excavation. Presented below are descriptions of all the artifacts recovered except projectile points and bifaces which are described and analyzed in a later section. The stratigraphic distribution of all recovered artifacts is presented in Table 4.

## Chipped and Ground Stone Artifacts

### GROUND STONE ARTIFACT

PROVENIENCE: S6E4 SE¼ S.100 E.130 50 cm BS

DESCRIPTION: Specimen 2-61941 is a small tabular piece of well sorted sandstone which shows evidence of slight grinding on one of the two flat surfaces. The specimen is too fragmentary to determine if it was once part of a large metate or metate-like grinding surface.

MATERIAL: Sandstone

MEASUREMENTS: Length, 6.5 cm; Width, 5.3 cm; Thickness, 1.8 cm; Weight, 112.9 g.

### PIGMENT PROCESSING TOOL (Fig. 21b)

PROVENIENCE: S6E6 SE¼ S.180 E.145 58 cm BS

DESCRIPTION: Specimen 2-61888 is a small, flat disk shaped piece of sand or mud stone. Along part of the circumference there is red staining and a series of small nicks to the working edge caused by the utilization of the specimen to chop or grind/abrade mineral pigments into powdered form and/or for the application of prepared pigment to the cave wall to form pictographs.

MATERIAL: Mud or Sandstone

MEASUREMENTS: Length, 5.6 cm; Width, 4.7 cm; Thickness, 1.2 cm; Weight, 41.9 g.

TABLE 4

STRATIGRAPHIC DISTRIBUTION OF ARTIFACTS
PAINTED CAVE

| Category | S - 10 | 10 - 20 | 20 - 30 | 30 - 40 | 40 - 50 | 50 - 60 |
|---|---|---|---|---|---|---|
| Ground stone | | | | | | 1 |
| Pigment Processing Tool | | | | | | 1 |
| Heavy Duty Core Chopper | | 1 | | | | |
| Cores-Bifacial, Single Platform, fragments | 1 | 1 | | | | 1 |
| Cores-exhausted | 1 | 1 | | | | |
| Straight Side Scraper* | | | | | | 1 |
| Straight End Scraper | | | | 1 | | |
| Notched Scraper | | | | | | 1 |
| Bifaces | 4 | 4 | 3 | | 1 | 4 |
| Worked/Utilized Flake | | | | 1 | | |
| Worked Flakes | | | 1 | 2 | | 1 |
| Edge Damaged/Utilized Flakes | | | | 1 | 1 | |
| Edge Damaged/Utilized Flake - Burin | 1 | | | | | |
| Sharp Cutting Edge Tool | | | | 1 | | |
| Projectile Points | 2 | 3 | 4 | 1 | 2 | 5 |
| Historic Artifacts | | 1 | 2 | 1 | | |
| Perishable Artifacts | | | 2 | | | |
| Ochre/Pigment Stones | | 3 | 3 | 1 | 1 | 2 |
| Total 69 | 9 | 14 | 15 | 9 | 5 | 17 |

* Worked bone

Note: No artifacts were recovered from depths of 60 - 70 cm BS.

HEAVY DUTY CORE/CHOPPER (Fig. 21d)

PROVENIENCE: S6E6 S.100 E.120 16 cm BS

DESCRIPTION: Specimen 2-61819 is a large, roughly circular chunk, modified on one side by a series of unifacial hard hammer percussion blows. Along this modified edge are two, spacially separate blows struck in the opposite direction resulting in partial bifacial retouch on the edge. Flake scar morphology suggests only one or two usable flakes were yielded by the retouch process. The generally poor quality of the raw material precluded further use of this piece as a core and thus its final use was as a heavy duty chopping implement.

MATERIAL: Chert

MEASUREMENS: Length, 11.5 cm; Width, 10.2 cm; Thickness, 4.6 cm; Weight, 549.4 g; Working Edge Angle, $72^{o}$-$80^{o}$.

BIFACIAL CORE

PROVENIENCE: S6E6 S.110 E.65 19 cm BS

DESCRIPTION: Specimen 2-61827 is a fist sized chunk of chert from which a few flakes have been struck off in opposite direction from the reworked edge. The core was subsequently fire cracked resulting in a large heat spall off the top surface of the core.

MATERIAL: Chert

MEASUREMENTS: Length, 9.0 cm; Width, 7.2 cm; Thickness, 4.5 cm; Weight, 234.5 g.

BIFACIAL CORE FRAGMENT

PROVENIENCE: S6E4 SE¼ Screen 0-10 cm BS

DESCRIPTION: Specimen 2-61915 is a large edge fragment broken off from a very large core. The fragment evidences a series of bifacial hard hammer percussion blows along the lateral edge of what was the larger core.

MATERIAL: Chert

MEASUREMENTS: Length, 10.6 cm; Width, 4.6 cm; Thickness, 3.3 cm; Weight, 152.5 g.

EXHAUSTED CORES/CORE NUCLEI (Fig. 21a,e)

SPECIMENS: 2

| | | | |
|---|---|---|---|
| PROVENIENCE: | S6E4 SE¼ Screen | 10-20 cm BS | 2-61919 |
| | S6E6 S.30 E.55 | Surface-10 cm BS | 2-61807 |

DESCRIPTION: Specimens 2-61919 and 2-61807 are exhausted cores. The smaller of the two is 2-61919.

MATERIAL: Chert

MEASUREMENTS: Length, range 3.4-5.2 cm; Width, range 2.7-4.5 cm; Thickness, range 2.7-3.0 cm; Weight, range 24.0-44.2 g.

EDGE DAMAGED/UTILIZED FLAKE - BURIN (Fig. 19o)

PROVENIENCE: S6E4 SE¼ Screen 0-10 cm BS

DESCRIPTION: Specimen 2-61977 is one fragment of a chert interior flake which has been snapped in two across the short axis. The fragment has one intact edge damaged/utilized lateral edge while the opposite edge is snapped off leaving a deep concavity. The junction of the edge of the concavity and the latitudinal snap face creates a very sharp burin tip which appears to have been utilized as such judging from the two small wear induced chips broken off from the working tip. These two small chips are only visible under magnification. The bottom end has steep unifacial retouching which produced a dull end scraper-like working surface.

MATERIAL: Chert

MEASUREMENTS: Length, 2.6 cm; Width, 2.1 cm; Thickness, 0.4 cm; Weight, 2.7 g; Working Edge Angle, 76°.

WORKED/UTILIZED FLAKE

PROVENIENCE: S6E6 NW¼ S.65 E.95 33 cm BS

DESCRIPTION: Specimen 2-61860 is a large side struck interior (biface-thinning) flake with a multifacetted striking platform and many dorsal flake scars. This chert flake terminates in a hinge end. Along the left ventral/right dorsal lateral edge are areas of prominant edge damage or more probably, utiliztion which has resulted in this lateral edge being quite dull.

MATERIAL: Chert

MEASUREMENTS: Length, 3.4 cm; Width, 4.4 cm; Thickness, 0.8 cm; Weight, 11.2 g; Working Edge Angle, 40-48°.

NOTCHED SCRAPER (Fig. 19n)

PROVENIENCE: S6E6 SW¼ Screen 50-60 cm BS

DESCRIPTION: Specimen 2-61970 is made on a medial fragment of a chert interior flake. Along one lateral edge are two adjacent small, shallow notches. The remaining edges are heavily edge damaged.

MATERIAL: Chert

MEASUREMENTS: Length, 2.8 cm; Width, 2.3 cm; Thickness, 0.6 cm; Weight, 4.0 g; Notch Depths, range 1.0-1.5 mm; Notch Opening Angle, range 110-112°.

SINGLE PLATFORM BIFACIAL CORE FRAGMENT

PROVENIENCE: S6E6 SE¼ S.100 E.150 54 cm BS

DESCRIPTION: Specimen 2-61890 is a fragment of a core. One lateral edge has been used as a striking platform for the bifacial removal of flakes.

MATERIAL: Chert

MEASUREMENTS: Length, 5.5 cm; Width, 3.8 cm; Thickness, 1.8 cm; Weight, 32.6 g.

SHARP CUTTING EDGE/SCRAPING TOOL (Fig. 20g)

PROVENIENCE: S6E6 NE¼ Screen 30-40 cm BS

DESCRIPTION: Specimen 2-61871 is made on a fragment of a large interior flake. The break or fracture face forms a natural 'backing' while the opposite lateral edge has been unifacially soft hammer percussion retouched to form a convex, semi-sinuous cutting edge or scraping tool.

MATERIAL: Chert

MEASUREMENTS: Length, 5.3 cm; Width, 2.3 cm; Thickness, 0.7 cm; Weight, 8.5 g; Working Edge Angle 30-40$^{o}$.

STRAIGHT END SCRAPER (Fig. 20h)

PROVENIENCE: S6E6 SE¼ Screen 30-40 cm BS

DESCRIPTION: Specimen 2-61972 is made on a secondary cortex flake fragment. The medial region snap face has been unifacially pressure retouched to form a straight scraping edge.

MATERIAL: Chert

MEASUREMENTS: Length, 2.8 cm; Width, 2.0 cm; Thickness, 0.5 cm; Weight, 2.1 g; Working Edge Angle 49$^{o}$.

WORKED BONE ARTIFACT

STRAIGHT SIDE SCRAPER (Fig. 21c)

PROVENIENCE: S6E6 NW¼ Screen 50-60 cm BS

DESCRIPTION: Specimen 2-61904 is a fragment of a large mammal long bone, which has been unifacially retouched along one of the longitudinal break surfaces. It is not apparent whether or not the piece was retouched when the bone was 'green' or after it had aged. The retouch is identical to that which is seen on conchoidally fracturing crypto-crystalline rocks.

MATERIAL: Bone

MEASUREMENTS: Length, 9.4 cm; Width, 1.8 cm; Thickness, 0.7 cm; Weight, 10.6 g; Working Edge Angle, 22-30$^{o}$.

PIGMENT STONES/OCHRE

SPECIMENS: White (2), Orange (1), Yellow (1), Red (6)

| | | | | | | |
|---|---|---|---|---|---|---|
| PROVENIENCE: | S6E6 | SW¼ | Screen | 10-20 cm BS | Red | 2-61828 |
| | S6E6 | NE¼ | Screen | 10-20 cm BS | Orange | 2-61831 |
| | S6E6 | SW¼ | Screen | 20-30 cm BS | Red | 2-61850 |
| | S6E6 | NW¼ | Screen | 20-30 cm BS | Red | 2-61854 |
| | S6E6 | NW¼ | Screen | 20-30 cm BS | Red | 2-61859 |
| | S6E6 | SE¼ | Screen | 50-60 cm BS | White | 2-61894 |
| | S6E6 | NW¼ | Screen | 50-60 cm BS | White | 2-61903 |
| | S6E4 | SE¼ | Screen | 10-20 cm BS | Yellow | 2-61920 |
| | S6E4 | SE¼ | Screen | 30-40 cm BS | Red | 2-61931 |
| | S6E4 | SE¼ | Screen | 40-50 cm BS | Red | 2-61935 |

DESCRIPTION: Red, white orange and yellow pieces of ochre up to 2 cm in diameter were recovered from the deposits at Painted Cave. Undoubtedly, this pigment was used for the coloring of the pictographs on the shelter walls but it is possible that the pigment was used for facial and artifact decoration/ornamentation. As shown in the provenience data presented above, red pigment was recovered only in the Disturbed Strata (10-50 cm BS), while white pigment was recovered only in the Undisturbed Strata (50-60 cm BS). Orange and yellow pigment was recovered from a depth of 10-20 cm BS. It is tempting to assign a temporal significance to this distribution, however the sample of recovered specimens is too small and more importantly, the bulk of the pigment material was recovered from disturbed strata.

## PERISHABLE ARTIFACTS

### Burned Twig

PROVENIENCE: S6E6 S.170 E.170 24 cm BS

DESCRIPTION: Specimen 2-61843 is a small branch or twig of sagebrush (*Artemisia sp.*(?)) from which the bark has been removed. There is no evidence of smoothing/working on the bare wood or any indication that the bark removal was due to cultural means. One end is flat and has indications of cutting present. The other end tapers into a blunt point which is burnt. The function (if any) of this piece is not known.

MEASUREMENTS: Length, 6.4 cm; Thickness, 0.7 cm.

### SAGEBRUSH BUNDLE

PROVENIENCE: S6E6 S.135 E.175 22-27 cm BS

DESCRIPTION: Specimen 2-61844 is a bundle of sagebrush (*Artemisia sp.*) bark strips and long narrow twigs. There is no evidence of binding (e.g. cordage) to hold the bundle together. The bundle has been compressed by the weight of the deposit and has a gentle bend or arc present. It is possible that the bundle may represent a raw material cache for basketry, sandle lining or for some other purpose.

MEASUREMENTS: Length, 25-28 cm; Width, 4-5 cm; Thickness, 2 cm.

## HISTORIC ARTIFACTS

### Flashbulbs

SPECIMENS: Complete (1), Fragmentary (1)

PROVENIENCE: S6E6 S.15 E.180 38 cm BS complete 2-61870
S6E6 Screen 20-30 cm BS fragmentary 2-61864

DESCRIPTION: Two Sylvania P 25 large flashbulbs were recovered from Painted Cave. Specimen 2-61870 is blue in color and is complete. Specimen 2-61864 is also blue in color but was recovered in small, heat-altered (melted) pieces. The bulbs are designed for color photography.

MEASUREMENTS: Length from top of bulb to bottom of metal stem, 6.10 cm; Width of bulb at point of maximum width, 3.81 cm; Length of stem, 1.60 cm;

Width of stem, 1.50 cm.

DISCUSSION: The recovery of these flashbulbs quite clearly indicates the disturbance of the deposits to a depth of at least 40 cm BS.

METAL WIRE

PROVENIENCE: S6E6 NW¼ Screen 10-20 cm BS

DESCRIPTION: This specimen (2-61837) is a piece of bent steel wire in a oxidized condition.

MEASUREMENTS: Length, 27.5 cm; Thickness, 0.42 cm.

IRON NAIL

PROVENIENCE: S6E4 SE¼ Screen 20-30 cm BS

DESCRIPTION: One specimen (2-61926) of heavily oxidized steel was recovered. It is quite brittle and has subsequently cracked and split into four pieces. It is possible that the piece was a steel or iron nail, but no diagnostic features are present due to the extreme rust.

MEASUREMENTS: Length, 8.0 cm; Thickness, undetermined due to rust.

WORKED FLAKES (Fig. 21i)

Worked flakes can be distinguished from both utilized/edge damaged flakes and more formal artifact types. Whereas edge damaged/utilized flakes are characterized by small random chips, nicks and wear patterns on an otherwise pristine edge, worked flakes are (seemingly) purposely retouched along the working edge or edges by either pressure retouch or soft or hard hammer percussion retouch or a combination of both. Worked flakes could have served in a variety of tasks but their amorphous morphology and random retouch precludes inclusion of these artifacts into formal types (e.g. scrapers).

SPECIMENS: 4

| | | | | | |
|---|---|---|---|---|---|
| PROVENIENCE: | S6E6 SE¼ | Screen | 30-40 cm BS | chert | 2-61966 |
| | S6E4 SE¼ | Screen | 30-40 cm BS | obsidian | 2-61967 |
| | S6E6 NW¼ | Screen | 20-30 cm BS | chert | 2-61974 |
| | S6E6 SW¼ | Screen | 50-60 cm BS | chert | 2-61975 |

DESCRIPTION: Specimen 2-61966 is made on an interior flake fragment. A small portion of the left ventral/right dorsal edge has been modified by pressure retouch forming a small shallowly concave scraper-like edge. Specimen 2-61967 is a small interior flake fragment showing evidence of previous flaking on one face and on two edges. Specimen 2-61974 is made on an interior flake fragment. Along one edge is a combination of three hard and soft hammer percussion flakes and small pressure flakes. Specimen 2-61975 is made on an interior flake fragment which is randomly pressure retouched on two edges.

MATERIAL: Chert (3), Obsidian (1)

| MEASUREMENTS: | Length | Width | Thickness | Weight | Working Edge Angle |
|---|---|---|---|---|---|
| 2-61966 | 3.5 cm | 2.4 cm | 0.5 cm | 3.7 g | $58^{0}$ |
| 2-61967 | 1.9 cm | 1.6 cm | 0.4 cm | 1.1 g | - |
| 2-61974 | 2.0 cm | 2.6 cm | 0.6 cm | 2.3 g | $63^{0}$ |
| 2-61975 | 2.3 cm | 1.8 cm | 0.4 cm | 2.6 g | $66^{0}$ |

EDGE DAMAGED/UTILIZED FLAKES

Edge damaged flakes have often been confused with a category of unmodified flakes described as 'utilized', by which is meant flakes which have no formal retouch present but which have been or may have been utilized in some task. The category described here consists of various types of flakes with slightly damaged edges of flakes which exhibit more prominent patterns of use-modification or use wear (crushing, nibbling, retouch) present on the lateral edges as noted by visual inspection or low power magnification (cf. Semenov 1964, Keeley 1974, Tringham, et al. 1974). Their function is uncertain but they may have been casually used for cutting and scraping purposes. Hester and Heizer's (1973b)extensive bibliography on experimental archaeology and lithic technology cites numerous studies dealing with the function of chipped stone tools through wear pattern analysis and numerous additional studies have appeared in the literature since its publication. Studies of this type have enhanced the ability of archaeologists to determine the function of many morphologically amorphous stone artifacts. However, there is still much confusion with the proper identification of culturally 'utilized' flakes and their separation from edge damaged flakes. Keller (1966) has demonstrated the extent to which natural processes can produce spurious artifacts, e.g. edge damage flakes mistaken for culturally utilized flakes, while Wylie (1975) cautions against improper laboratory techniques (e.g. washing, loose tray storage or artifacts, improper handling - "bag clatter") producing spurious edge damage interpretations on specimens.

The results of a recent deer butchering experiment (Hester, Spencer, Busby and Bard 1976) are directly relevant to this problem. The obsidian flakes used in this experiment showed little evidence of 'utilization' as determined by edge wear analysis if the tool did not come into contact with the bone. Thus, it would appear that of flakes recovered from archaeological contexts, exhibiting little to no use-wear ('utilization') or edge damage either may never have been used for any purpose, or may have served as convenient cutting, slicing and scraping tools while moderately edge damaged flakes may only be the result of the natural factors discussed by Keller (1966) rather than cultural factors. Therefore this category is included for information only and will not be considered as a formal artifact category in the sense of deliberate manufacture and use, although they may have been deliberately manufactured for some purpose.

SPECIMENS: 2

PROVENIENCE: S6E6 NW¼ Screen 30-50 cm BS 2-61973
S6E6 NE¼ Screen 30-40 cm BS 2-61979

DESCRIPTION: Specimen 2-61973 is an interior flake which exhibits noticeable edge damage/utilization on both lateral edges and along the distal edge. Specimen 2-61979 is a small interior flake fragment which has a small area of edge damage/utilization along part of the edge resembling pressure retouch scars.

MATERIAL: Chert

MEASUREMENTS: Length, 2.4-2.6 cm; Width, 2.8-1.5+ cm; Thickness, 0.4 cm; Weight, 1.6-2.9 g.

## PROJECTILE POINTS

Painted Cave yielded 17 typable projectile points, projectile point fragments and projectile point preforms. Type classification follows the standard typologies established and in use for the Great Basin (cf. Hester and Heizer 1973, Heizer and Hester 1978 for a discussion). All typable points were subjected to an attribute analysis in order to quantify the similarities and differences between types with respect to the technology employed in their manufacture. Many of the attributes presented in Table 5 are self explanatory, however the following definitions are presented to clarify other aspects of the analysis. The provenience of Painted Cave projectile points is summarized in Table 6.

### Dorsal and Ventral Side Determination

Because intensive analysis of the edges of projectile points and other chipped stone artifacts requires the identification of the dorsal and ventral faces, several indicators are used to determine this aspect. If a flake curvature is present on the longitudinal axis of the specimen, the face containing the concavity is considered to be the ventral face. As well, the flatter side of a projectile point viewed in cross section is considered to be ventral. The presence of original flake surface on a side exhibiting positive flake scar morphology is considered to be ventral. When use of the above criteria fail to yield a determination, the face with the museum catalog number is arbitrarily considered to be ventral.

Flaking Types

The following flaking type categories have been utilized previously (Bard, Busby and Kobori 1978) to help describe the technique used to retouch or finish projectile points.

1. Parallel Flaking - Parallel flakes traveling perpendicular to the longitudinal axis, completely across the point.
2. Parallel Oblique Flaking - Parallel flakes traveling completely across the point, but at an angle to the longitudinal axis.
3. Parallel Convergent Flaking - Parallel flaking starting from both sides and meeting at the approximate center.
4. Mixed Flaking - A mixture of parallel and non-parallel multi-directional flaking.
5. Nonparallel Flaking - Multidirectional Flaking.
6. Edge Retouch - Edge retouch around original flake surface.

To the above categories we add one more flaking type which better defines the kind of pressure flaking employed, and directly, the manner in which force is transmitted from the pressure flaker. "Push" and "Pull" pressure flaking has been recently identified by Patten (1978:3-4). Since this attribute is presently unfamiliar to most archaeologists, Patten's discussion will be briefly reviewed here. The morphological differences between these two different types of pressure flaking are best demonstrated by illustration (Patten 1978:3). The following attributes were determined to be diagnostic by Patten (1978:4) and are presented below:

> Push pressure flaking yields debitage characterized by: parallel sides, small interspaces, long - narrow scars, high ridges, usually organized, flat trajectory, lacking bulb, feathered termination, compression rings with consistently large radii, fine material - usually heat treated, sharp median ridges possible.

> Pull pressure flaking yields debitage charcaterized by : expanding sides, large interspaces, fat scars, low ridges, often random directed, arced trajectory, prominent bulb, abrupt termination, compression rings with expanding radii, coarse material, rounded median ridges.

These morphological differences suggest differences in manufacturing technique where the Push technique is characterized by steady support of the stone, firm support of the pressor, force applied in direction of fracture, slow detachment, segregated platforms, shallow 'bite' and use of a pointed pressor. Pull technique can be characterized by loose support of the stone, loose support of pressor, force applied away from fracture, fast detachment, simple platforms, deep 'bite' and pressor can be dull.

Flake Scar Count

Flake scars were counted for the first centimeter from the most proximal portion of the barb (or blade edge on unbarbed points) toward the distal end of the point. These measurements were made on four edges of each projectile point; dorsal left, dorsal right, ventral left and ventral right. The count is taken beyond any initial edge shatter. In the case of a broken point, the count started with the first complete flake scar, and all counts are rounded to the nearest half.

DESERT SIDE NOTCHED SERIES (Tables 5 and 6, Fig. 19a-c)

Triangular side notched arrow points are a common style in late prehistoric times in the Great Basin, and are characteristic of late phases from Mexico to the Northern Plains. For the Great Basin, Baumhoff and Byrne (1959) refer to these as Desert Side Notched and have postulated a date of A.D. 1500 for their introduction (Hester and Heizer 1973:9). Radiocarbon dates for the Desert Side Notched series range from ca. A.D. 440 to A.D. 1720 and indicate that the series appeared sometime after A.D. 1100 - 1200 and persisted into the historic era. The date of A.D. 440 from Deer Creek has been discounted as being much too early (cf. discussion in Hester and Heizer 1973:10). Desert Side Notched points continued to be manufactured and utilized by ethnographic Great Basin groups. Layton (1970:225 and 1977) reports the direct association of Desert Side Notched among charred remains of domestic cow at Hanging Rock Shelter which suggests the possibility that the Desert Side Notched was used by historic Northern Paiute groups.

SPECIMENS: Complete (1), Fragmentary (3)

MATERIAL: Chert (3), Obsidian (1)

DESCRIPTION: The Painted Cave Desert Side Notched points are generally small sized, slender triangular points with straight to slightly convex lateral blade edges. The bases range from having a small basal notch (0.7 - 2.5 mm deep) to marked basal concavity. In larger populations of Desert Side Notched points however, straight or slightly concave bases are common. Fine side notches, perpendicular to the long axis of the points range from 1.1 - 2.1 mm in depth. Three specimens are biconvex in cross section while one is plano-convex. Three are made on interior flakes while one is made on a secondary cortex flake. Flaking ranges from edge retouch on two specimens where original flake surface remains, to mixed flaking and parallel convergent flaking on another specimen. All specimens can be considered to have been Pull pressure retouched. One specimen (2-61923) was retouched in such a fashion to create fine serrations along the intact lateral edge. The length of the complete specimen is 2.0 cm while width measurements for the recovered specimens range from 1.1 - 1.3 cm and thickness measurements range from 0.20 - 0.30 cm. Weight of the intact specimen is 0.5 g. The flake scar counts are not significant in this case due to the small population and the use of edge retouch which produces indistinct edge scars.

COTTONWOOD SERIES (Tables 5 and 6, Fig. 19d-k)

The Cottonwood series was first proposed by Lanning (1963) in his analysis of projectile points from the Rose Spring site. He recognized two varieties: Cottonwood Triangular and Cottonwood Leaf-Shaped. A third variety, Cottonwood Bipointed, was later described by Heizer and Clewlow (1968). These small arrow points are common in late prehistoric and historic times in the Great Basin and in many cases, Cottonwood points co-occur with the Desert Side Notched series (Hester and Heizer 1973:10). Radiocarbon dates for this series range from ca. A.D. 900 to ca. A.D. 1620 and this suggests that the series may have begun prior to ca. A.D. 1300 as indicated by Lanning (1963).

SPECIMENS: Complete (3), Fragmentary (5)

MATERIAL: Chert (6), Obsidian (2)

DESCRIPTION: The Cottonwood series specimens recovered from Painted Cave are roughly triangular to slightly elongate triangular in outline with slightly convex to straight blade edges. The bases range from straight to slightly concave with one obsidian specimen (2-61856) having a rather deeply concave base. This particular specimen closely resembles a deeply concave base Cottonwood illustrated in Hester and Heizer (1973:Fig. 4k). The Painted Cave Cottonwood points are generally biconvex in cross section or plano-convex and are generally made on small interior flakes. The specimens range from having minimal edge retouch type flaking where original ventral (or dorsal) flake surface was left intact to having careful parallel convergent flaking, the majority being trimmed by mixed flaking. These specimens are predominately retouched by Pull pressure retouch with only slight Push pressure retouch evident on obsidian specimen 2-61878 and chert specimen 2-61899. Length for complete specimens range from 1.7 - 3.1 cm; width from 1.3 - 1.8 cm and thickness from 0.20 - 0.40 cm and weight from 0.6 - 1.5 g. The width of one specimen is only 1.1 cm. Flake scars per cm of lateral blade edge range from as few as 3.0 scars to as many as 6.0 scars indicating wide variation in the amount of retouch applied to the series, this also being indicated by the seeming lack of preference among mixed, parallel convergent and edge retouch types of flaking. The above metric attributes and morphological attributes are presented in Table 5.

EASTGATE SERIES (Tables 5 and 6, Fig. 19L)

The Eastgate type was originally described by Heizer and Baumhoff (1961) and occurs in two forms: the Expanding Stem and Split Stem varieties. Eastgate series points can be distinquished from the morhpologically similar and contemporaneous Rose Spring points by the distinctive squared barbs and other morphological characteristics (cf. Lanning 1963, Heizer and Baumhoff 1961, Heizer and Clewlow 1968, O'Connell and Ambro 1968, Hester and Heizer 1973 and Bard, Busby and Kobori 1978). Based on radiocarbon evidence both the Rose Spring and Eastgate series experienced a major floruit between A.D. 600-700 and A.D. 1100, with examples continuing to be used into historic times. There is some evidence that the types may have been in use by 300 B.C. (cf. discussion in Hester and Heizer 1973:8).

Hester and Heizer (1973:8-9) believe it is highly likely that the introduction of Rose Spring and Eastgate points can be equated with the introduction of the bow and arrow as both series represent a 'break' in the projectile point sequence. The appearance of smaller and lighter points elsewhere in North American is associated with the bow and arrow. Because of the above mentioned reasons and the difficulty distinquishing between certain Rose Spring and Eastgate specimens due to their morphological similarity some archaeologists prefer to consider them as one type... a Rose-Gate type (D.H. Thomas, personal communication, 1978).

SPECIMENS: Complete (1)

MATERIAL: Chert

DESCRIPTION: The Eastgate Expanding Stem recovered from Painted Cave is elongate triangular in outline with one straight and one slightly convex lateral edge. The base is slightly convex and has two characteristic basal notches leaving an expanding stem. The specimen was made on an interior flake and has an essentially flat cross section that becomes biconvex towards the medial and distal regions of the body. The point was recovered in two separate pieces from the same part of the deposit. Both the dorsal and ventral sides exhibit non-parallel flaking (multidirectional flaking). The pressure flaking exhibited is of the Pull variety. Flake scar counts range from 6.0 scars/cm to 7.5 scars/cm. The length is 4.8 cm, width 2.0 cm, the thickness 0.3 cm and the weight 2.8 g.

PROJECTILE POINT PREFORM (Fig. 19m)

The term preform designates a stage in the manufacture of an artifact after initial shaping but before completion (cf. Crabtree 1972:85). Bard, Busby and Kobori (1978) distinquish two types of preforms; 'generalized' preforms which are not morphologically close enough to the finished artifact to be identified with the mental template of the knapper, and 'specific' type preforms (e.g. Eastgate preform) which are sufficiently shaped and trimmed that they can be accurately identified as to the final intended type or style.

Specimen 2-61876/61857, found in two pieces, seems to fall between theses two categories. As a generalized preform, this specimen fits well into the 'secondary retouched' group as defined by Crabtree (1972:85,94,96) and discussed at length by Bard, Busby and Kobori (1978). Secondary retouched preforms exhibit the finished artifact flaking type, they are thinned, have most of the irregularities removed and at this stage, the edges are straightened and sharpened. As a specific type preform, the specimen is almost identical in metric measurements (see Table 5) and overall outline to the Eastgate Expanding Stem recovered from the Painted Cave deposits. The preform is not quite as wide at the base as the Eastgate specimen, but this is due to manufacture breakage on one of the barb regions resulting in the loss of critical basal area. It is probable that this specimen was abandoned at this stage of manufacture for that reason. The preform is manufactured on a secondary cortex chert flake and is bi-convex in cross section. The flaking is of the mixed type with 4.0 flake scars/cm on the ventral side and 3.0 - 3.5 scars/cm on the dorsal side. Attributes for this specimen are presented along with the projectile point attributes in Table 5.

PROJECTILE POINT FRAGMENTS

Three distal fragments were recovered from the deposits at Painted Cave. One specimen was made on obsidian, the other two on chert. See Table 5 for measurements and provenience data.

## Table 5

PAINTED CAVE PROJECTILE POINTS - METRIC ATTRIBUTES

| UCLMA# | Provenience | Type | Material | Condition | Measurements L. | W. | Th. | Wt. | X- | Flake Scar Count Vl | Vr | Dl | Dr | Flaking Type Vl | Vr | Dl | Dr |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2-61878 | S6E6 SW¼ 50cms Screen | CT | Obsidian | complete(minor-barb damage) | 3.1 | 1.8 | 0.40 | 1.5 | BC | 3.5 | 3.0 | 3.5 | 3.5 | M | M | PC | NP |
| 2-61900<br>2-61898 | S6E6 SW¼ 50-60 Screen<br>S6E6 S.138 E.99 Living Floor | CT | Chert | complete(found-in 2 pieces) | 2.4 | 1.8 | 0.20 | 0.9 | PC | 4.0 | --- | --- | 3.0 | PC | - | - | ER |
| 2-61856 | S6E6 NW¼ 20-30 Screen | CT | Obsidian | complete | 1.7 | 1.3 | 0.30 | 0.6 | BC | 4.0 | 5.0 | 5.0 | 3.0 | ER | PC | ER | ER |
| 2-61893 | S6E6 SE¼ 50-60 Screen | CT | Chert | distal & lateral edges missing | 2.2+ | 1.4+ | 0.35 | 1.4 | BC | --- | 2.5 | 3.0 | --- | - | NP | M | - |
| 2-61930 | S6E4 SE¼ 30-40 Screen | CT | Chert | distal end missing | 1.7+ | 1.6 | 0.20 | 0.9 | BC | 5.0 | 6.0 | 4.0 | 5.0 | PC | M | PC | ER |
| 2-61899 | S6E6 SW¼ 50-60 Screen | CT | Chert | distal end missing | 1.5+ | 1.4 | 0.25 | 0.6 | BC | 3.0 | 5.0 | 4.0 | 5.0 | M | M | M | M |
| 2-61858 | S6E6 NW¼ 20-30 Screen | CT | Chert | distal end missing | 1.4+ | 1.4 | 0.30 | 0.6 | PC | --- | --- | 5.0 | 6.0 | - | - | ER | ER |
| 2-61820 | S6E6 SE¼ 10-20 Screen | CT | Chert | portion of prox. end present | 0.6+ | 1.1 | 0.20 | 0.3 | BC | --- | --- | --- | --- | - | - | - | - |
| 2-61895 | S6E6 SE¼ 50-60 Screen | DSN | Chert | complete | 2.0 | 1.3 | 0.20 | 0.5 | BC | 5.0 | 5.0 | 6.0 | 6.0 | M | M | M | PC |
| 2-61923 | S6E4 SE¼ 10-20 Screen | DSN | Obsidian | proximal frag. serrated edge | 1.3+ | 1.1 | 0.30 | 0.4 | PC | --- | 4.0 | 4.0 | 6.0 | ER | ER | ER | ER |
| 2-61943 | S6E4 SE¼ 57 Screen | DSN | Chert | medial frag. | 1.0+ | 1.1 | 0.25 | 0.4 | BC | 8.0 | --- | 6.0 | 10.0 | ER | - | ER | NP |
| 2-61851 | S6E6 NW¼ 20-30 Screen | DSN | Obsidian | proximal frag. | 0.5+ | 0.9+ | 0.20 | 0.2 | BC | --- | --- | --- | --- | - | - | - | - |
| 2-61872<br>2-61873 | S6E6 SE¼ 30-50 Screen<br>S6E6 SE¼ 48-50 Screen | EGES | Chert | complete(found-in two pieces) | 4.8 | 2.0 | 0.30 | 2.8 | BC | 7.5 | 7.5 | 6.0 | 7.0 | NP | NP | NP | NP |
| 2-61876<br>2-61857 | S6E6 SW¼ 35 Screen<br>S6E6 S.105 E.70 28cm | PRFM | Chert | complete(found-in two pieces) | 4.9 | 1.6+ | 0.35 | 2.8 | BC | 4.0 | 4.0 | 3.5 | 3.0 | M | M | M | M |
| 2-61916 | S6E4 SE¼ 0-10 Screen | Distal frag. | Chert | | 2.5+ | 1.4+ | 0.35 | 1.2 | BC | --- | --- | --- | --- | - | - | - | - |
| 2-61822 | S6E6 S.134 E.150 18cm | Distal frag. | Obsidian | | 2.1+ | 1.0+ | 0.30 | 0.7 | BC | --- | --- | --- | --- | - | - | - | - |
| 2-61809 | S6E6 NW¼ S-10 Screen | Distal frag. | Chert | | 0.7+ | 1.1+ | 0.25+ | 0.2 | BC | --- | --- | --- | --- | - | - | - | - |

KEY: Provenience- Unit, Quad, Depth below surface in cms, location of specimen. Type- CT = Cottonwood Triangular, DSN = Desert Side Notched, EGES = Eastgate Expanding Stem, PRFM = Preform. Measurements- L. = Length, W. = Width, Th. = Thickness, Wt. = Weight, length, width and thickness in cms, weight in grams. X- = Cross-section, BC = Biconvex, PC = Plano-convex. Flake Scar Count- Vl = Ventral side, left; Vr = Ventral side, right; Dl = Dorsal left, Dr = Dorsal right. Flaking Type - M = Mixed flaking, NP = Non-parallel flaking, PC = Parallel convergent, ER = Edge retouch flaking.

TABLE 6

PROJECTILE POINT PROVENIENCE

| | | | | | | |
|---|---|---|---|---|---|---|
| 2-61809 | Distal fragment | Chert | S 6 E 6 | NW¼ | Surface - 10 | Screen |
| 2-61820 | Cottonwood Trnglr | Chert | S 6 E 6 | SE¼ | 10 - 20 | Screen |
| 2-61822 | Distal fragment | Obsidian | S 6 E 6 | S.134 E.150 | -18 | |
| 2-61856 | Cottonwood Trnglr | Obsidian | S 6 E 6 | NW¼ | 20 - 30 | Screen |
| 2-61857 | Preform | Chert | S 6 E 6 | S.105 E.70 | -28 | |
| -61876 | " | " | S 6 E 6 | SW¼ | 30 - 50 | ca -35 |
| 2-61858 | Cottonwood Trnglr | Chert | S 6 E 6 | NW¼ | 20 - 30 | Screen |
| 2-61872 | Eastgate Exp.Stem | Chert | S 6 E 6 | SE¼ | 30 - 50 | Screen |
| -61873 | " | " | S 6 E 6 | SE¼ | 48 - 50 | Screen |
| 2-61878 | Cottonwood Trnglr | Obsidian | S 6 E 6 | SW¼ | -50 | Screen |
| 2-61893 | Cottonwood Trnglr | Chert | S 6 E 6 | SE¼ | 50 - 60 | Screen |
| 2-61895 | Desert Side Notch | Chert | S 6 E 6 | SE¼ | 50 - 60 | Screen |
| 2-61898 | Cottonwood Trnglr | Chert | S 6 E 6 | S.138 E.99 | LIVING FLOOR | |
| -61900 | " | " | S 6 E 6 | SW¼ | 50 - 60 | Screen |
| 2-61899 | Cottonwood Trnglr | Chert | S 6 E 6 | SW¼ | 50 - 60 | Screen |
| 2-61916 | Distal fragment | Chert | S 6 E 4 | SE¼ | 0 - 10 | Screen |
| 2-61923 | Desert Side Notch | Chert | S 6 E 4 | SE¼ | 10 - 20 | Screen |
| 2-61930 | Cottonwood Trnglr | Chert | S 6 E 4 | SE¼ | 30 - 40 | Screen |
| 2-61943 | Desert Side Notch | Chert | S 6 E 4 | SE¼ | -57 | Screen |
| 2-61851 | Desert Side Notch | Obsidian | S 6 E 6 | NW¼ | 20 - 30 | * |

* Recovered in with lithic debitage.

BIFACES (Fig. 20a-f)

Bifaces have long been relegated to minor descriptions and analyses in the majority of site reports for the Great Basin. There is thus a need for reasonable detailed descriptions and attribute analyses for use in intra-regional and intra-site comparisons. Busby (1978) and Bard, Busby and Kobori (1978) have provided some degree of standardization in biface description which may help archaeologists discover culturally meaningful distributions (e.g. projectile points, 'knives', quarry blanks, preforms, etc.) in the large amorphous category referred to often as bifaces.

The chipped stone specimens assigned to this category are pieces that show evidence of extreme bifacial flaking (usually covering the dorsal and ventral faces) with at least one edge capable of being utilized for cutting, scraping, or sawing tasks. Bifaces are probably multi-purpose in function and range in form from a crudely worked flake or blade to a carefully retouched sharp cutting edge 'knife' suitable for hafting. Obviously, projectile points are preforms and 'blanks' are kinds of bifaces, however they are discussed elsewhere in this report.

The typology proposed for bifaces, already presented in detail by Busby (1978:112-123) will not be outlined here. The Busby typology is strongly modeled after Kleindienst's (1962) morphological typology. Unfortunately only 16 fragmentary bifaces were recovered from Painted Cave, and only a few are 'typable' (with reservations), thus precluding a multi-attribute analysis. It is hoped that future excavation at Painted Cave and surface reconnaissance in the nearby areas will increase the available sample of 'bifaces' from this relatively poorly known area of the Great Basin.

Five (nearly) typable specimens were recovered from Painted Cave and fall into two types (no sub-types). Chert is the primary raw material choice (15 of 16 specimens), with only one specimen of obsidian. Morphologically, the specimens range from ovate to lanceolate in form. No edge wear analysis was conducted although such studies would be of value in determination of the functions of these bifaces.

SPECIMENS: Fragmentary (16)

| | | | | |
|---|---|---|---|---|
| PROVENIENCE: | 2-61808 | S6E6 NW¼ | Screen | Surface - 10 cm |
| | 2-61976 | S6E6 NW¼ | Screen | Surface - 10 cm |
| | 2-61813 | S6E6 SW¼ | Screen | Surface - 10 cm |
| | 2-61914 | S6E4 SE¼ | Surface | 0 - 10 cm |
| | 2-61969 | S6E6 NE¼ | Screen | 10 - 20 cm |
| | 2-61968 | S6E6 SW¼ | Screen | 10 - 20 cm |
| | 2-61836 | S6E6 NW¼ | Screen | 10 - 20 cm |
| | 2-61832 | S6E6 S.85 W.120 | | 19 cm |
| | 2-61845 | S6E6 SE¼ | Screen | 20 - 30 cm |
| | 2-61847 | S6E6 SE¼ | Screen | 20 - 30 cm |
| | 2-61980 | S6E6 NE¼ | Screen | 20 - 30 cm |
| | 2-61882 | S6E6 NW¼ S.88 E.63 | | 50 cm |
| | 2-61892 | S6E6 SE¼ S.130 E.132 | | 58 cm |
| | 2-61971 | S6E6 SW¼ | Screen | 50 - 60 cm |
| | 2-61891 | S6E6 SE¼ | Screen | 50 - 60 cm |
| | 2-61978 | S6E6 SE¼ | Screen | 50 - 60 cm |

<u>TYPE I</u> - <u>OVATE</u> (Fig. 20a-c)

SPECIMENS: Fragmentary (3)

MATERIAL: Chert

DESCRIPTION: These proximal fragments are ovate in form (cf. Busby 1978: Fig. 24) with convex bases. The lateral edges are convex and the cross sections are biconvex. Specimens 2-61971and 2-61882 are quite crude while 2-61847 has been finely retouched and can be loosely referred to as a 'knife.'

MEASUREMENTS: Length, 2.2+-3.1+ cm; Width, 2.5-4.0 cm; Thickness, 0.4-1.6 cm; Edge Angle, $42^{\circ}$-$64^{\circ}$.

<u>TYPE II</u> - <u>NARROW LANCEOLATE</u> (Fig. 20d-e)

SPECIMENS: Fragmentary (2)

MATERIAL: Chert

DESCRIPTION: The specimens are narrow lanceolate in outline, especially 2-61892 and both have convex bases. The lateral edges are slightly convex and 2-61892 is biconvex in cross section while 2-61891 is roughly plano-convex.

MEASUREMENTS: Length, 2.9+ - 3.1+ cm; Width, 2.0-2.6 cm; Thickness, 0.6-0.7 cm; Edge Angle, $33^{\circ}$-$44^{\circ}$.

<u>NON-TYPABLE FRAGMENTS</u>

SPECIMENS: Fragmentary (11)

MATERIAL: Chert (10) Obsidian (1)

DESCRIPTION: This group consists of 4 proximal fragments (2-61832, 2-61914,

Figure 19

| | | |
|---|---|---|
| Row 1: | a-c | Desert Side Notched Projectile Points (2-61923, 2-61943, 2-61895) |
| | d | Cottonwood Triangular Projectil Point (2-61930) |
| Row 2: | e-h | Cottonwood Triangular Projectile Points (2-61900, 2-61899, 2-61893, 2-61858) |
| Row 3: | i-k | Cottonwood Triangular Projectile Points (2-61878, 2-61856, 2-61820) |
| | l | Eastgate Expanding Stem Projectile Point (2-61872/61873) |
| Row 4: | m | Projectile Point Preform (2-61876/61857) |
| | n | Notched Scraper (2-61970) |
| | o | Edge Damaged/Utilized Flake - Burin (2-61977) |


Figure 19

Figure 20

| | | |
|---|---|---|
| Row 1: | a-c | Biface, Type I (2-61971, 2-61882, 2-61847) |
| Row 2: | d-e | Biface, Type II (2-61891, 2-61892) |
| | f | Biface fragment (2-61914) |
| Row 3: | g | Sharp Cutting Edge/Scraping Tool (2-61871) |
| | h | Straight End Scraper (2-61972) |
| | i | Worked Flake (2-61974) |

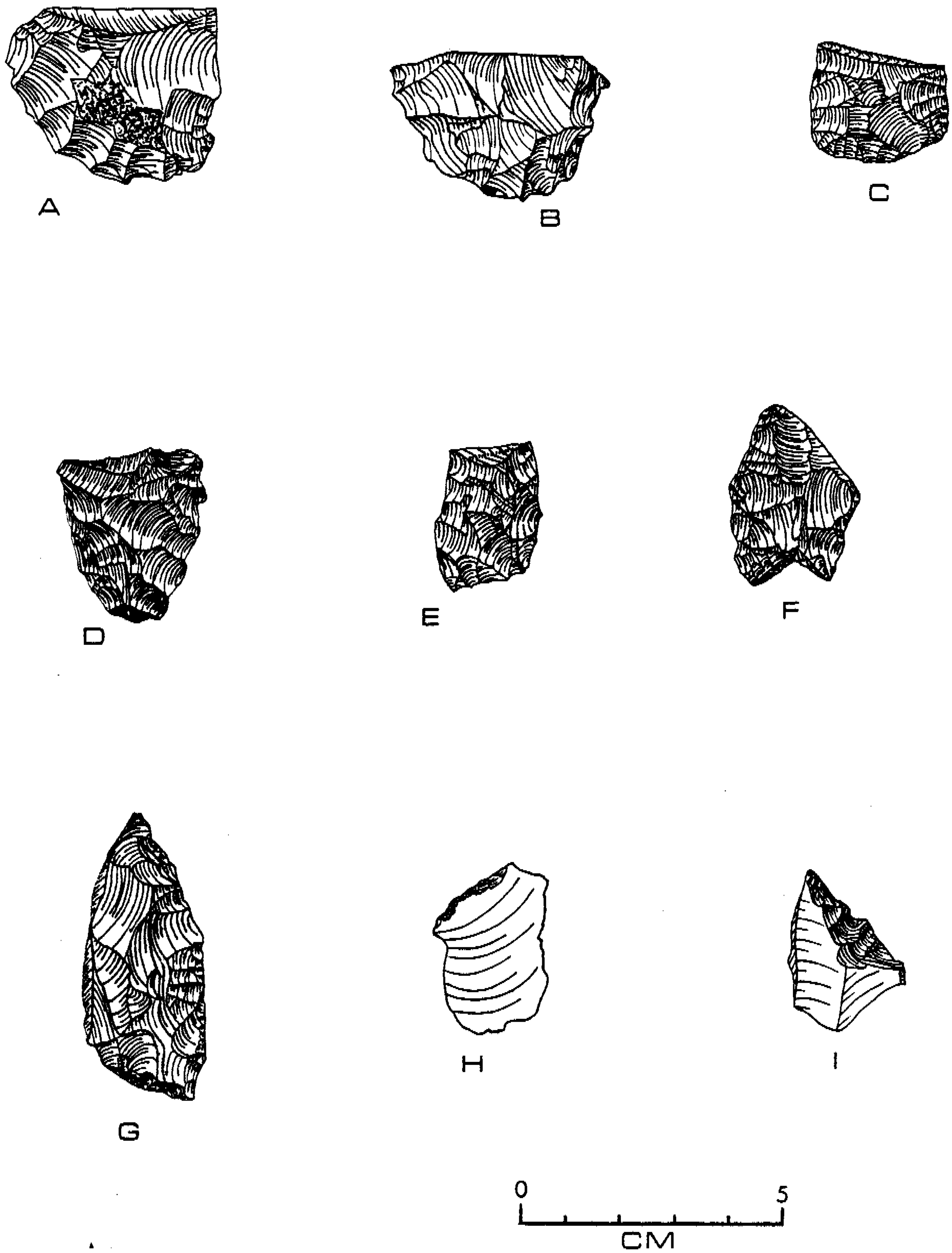



Figure 20

Figure 21

| | | |
|---|---|---|
| Row 1: | a | Exhausted Core (2-61807) |
| | b | Pigment Processing Tool (2-61888) |
| Row 2: | c | Straight Side Scraper/Worked Bone (2-61904) |
| | d | Heavy Duty Core Chopper (2-61819) |
| Row 3: | e | Exhausted Core (2-61919) |

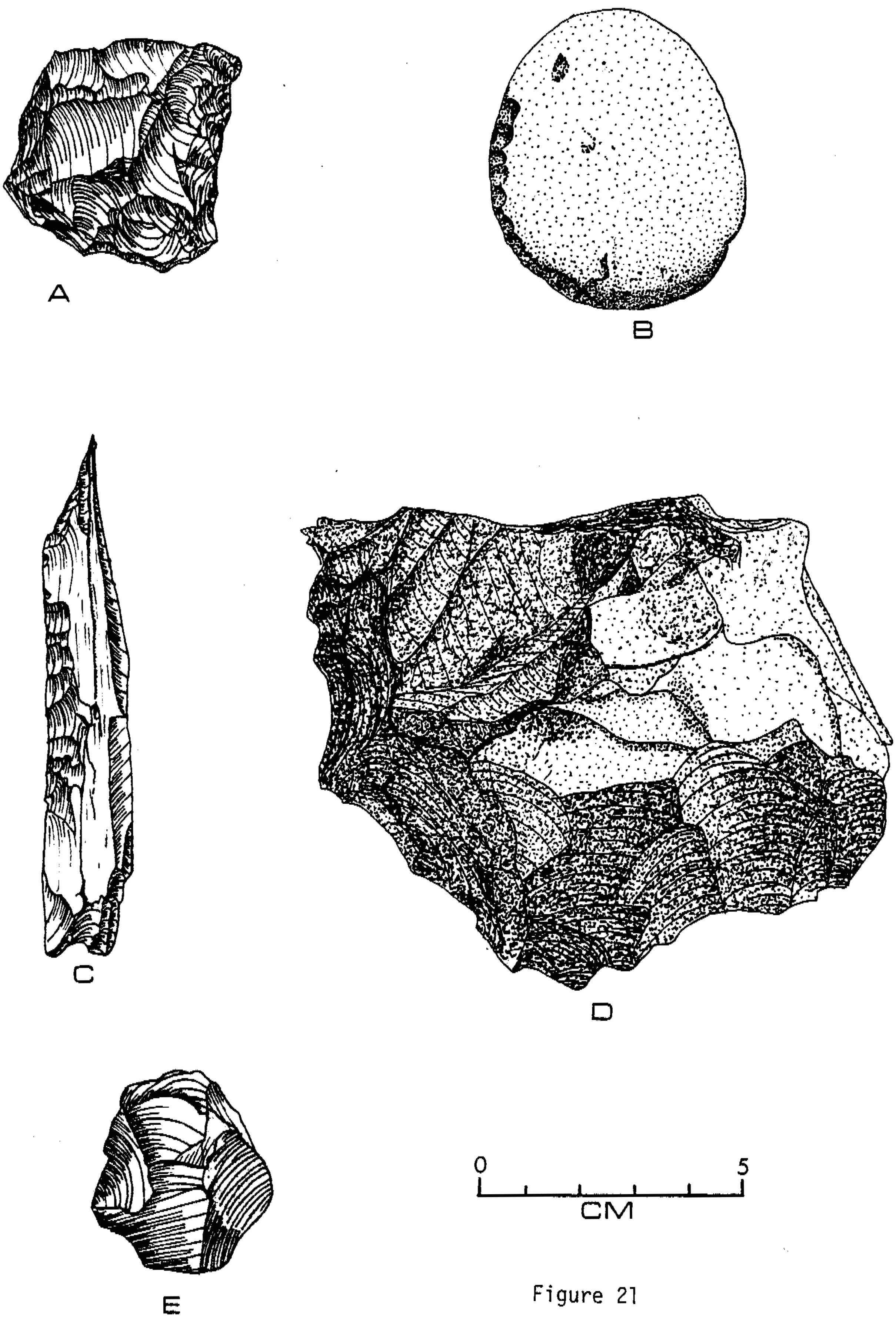



Figure 21

2-61808 and 2-61845), 3 medial fragments (2-61813, 2-61969, and 2-61968), 3 distal fragments (2-61836, 2-61978 and 2-61976) and one splinter from an unknown location on the biface (2-61980). All specimens except one (2-61914, plano-convex) are biconvex in cross section.

MEASUREMENTS:

Proximal: Length, 2.2+ - 4.9+ cm; Width, 1.4+ - 2.4 cm; Thickness, 0.3-0.6 cm; Edge Angle, $36^o$-$57^o$.

Medial: Length, 1.1+ - 2.5+ cm; Width, 1.2+ - 3.2 cm; Thickness, 0.2-0.8 cm; Edge Angle, $25^o$-$54^o$.

Distal: Length, 1.4+ - 3.4+ cm; Width, 1.2+ - 2.7± cm; Thickness, 0.3-0.5 cm; Edge Angle, $40^o$-$41^o$.

Splinter: Length, 2.2 cm; Width, 0.7 cm; Thickness, 0.2 cm; Edge Angle, $37^o$.

LITHIC DEBITAGE ANALYSIS

A total of 7148 pieces of lithic debitage (unmodified whole flakes, flake fragments and angular waste) weighing 3363.0 grams were recovered from the excavated deposits of units S6E6 and S6E4. An overwhelming preference for crypto-crystalline rock (chert and chalcedony) as a raw material is demonstrated by its relative abundance, 7094 pieces (99.2%); to obsidian, 52 pieces (0.7%) and basalt, 2 pieces (0.03%). Of this population of 7148 pieces of debitage, most was in the form of flake fragments, 5977 pieces (83.6%) with whole flakes, 674 pieces (9.4%) and waste, 497 pieces (7.0%) being much less common. By weight of debitage, flake fragments dominated, 2146.9 grams (63.8%) followed by whole flakes, 786.4 grams (23.4%) and waste, 429.1 grams (12.8%). Because much of the lithic debitage was recovered from Disturbed Strata (A, Cow Feces Layer, B, C, D, E, and F (see below) 6063 pieces (84.8%) while only a small amount was recovered from the Undisturbed Strata (G, H), 1085 pieces (15.2%) detailed stratigraphic analysis of the debitage would be fruitless except for the small sample from the Undisturbed Strata. It should be noted that only strata G and H of the Undisturbed Strata (not stratum F) received further study and, for the purposes of this present discussion, lithic debitage from stratum F was grouped with the debitage from Disturbed Strata A-E. The reason for this is simply that stratum F, a relatively thick layer, is somewhat disturbed in the upper portions and rather intact in the area close to the boundary with stratum B. The faunal analysis (Appendix I) is handled similarly. By weight, the above relationship maintains: Disturbed Strata, 3037.8 grams (90.3%) and Undisturbed Strata, 325.2 grams (9.7%). Results of the lithic debitage analysis are presented in Table 7 (Stratigraphic Distribution of Lithic Debitage) and in summary form in Table 8 (Summary Stratigraphic Distribution of Lithic Debitage). The debitage from the Disturbed Strata was also qualitatively evaluated.

All stages of lithic manufacture are represented in the Disturbed Strata debitage with primary cortex, secondary cortex and interior flakes present. Emphasis on the later stages of lithic processing is evident from the relative paucity of decortification flakes (primary cortex) and great abundance of secondary cortex and interior flakes, especially the latter. Large numbers of biface thinning flakes and smaller sized, soft hammer retouch flakes support the interpretation that raw material, obtained at an unlocated quarry site, was decortified prior to being carried into the site as quarry blanks or in some other form (tabular pieces etc.). The quarry blanks or decortified pieces were then modified into bifacial implements, preforms, projectile points and other chipped stone artifacts and/or were processed to yield usable secondary cortex and interior flakes for various tasks or further formal retouch.

The Undisturbed Strata lithic debitage was subjected to an intensive attribute analysis in order to elucidate the nature of lithic workshop activities carried out at the site. The rationale for attempting an attribute analysis of the debitage follows that explained in the Pink Point Site report (NV-Hu-302), a single phase discrete lithic scatter situated along the North Fork of the Little Humboldt River in north central Nevada (cf. Busby, Bard and Clark, In press). At this site an attribute analysis of the whole flakes revealed quantitative differences in the technology employed in core-flaking and biface thinning. At the Pink Point Site only four Cottonwood Triangular projectile points were present thus placing the site within a tightly circumscribed temporal period. Although the Pink Point lithic analysis can only shed light on the kinds of technology employed (and by deduction, the kinds of activities carried out) at that particular site

# TABLE 7

## PAINTED CAVE

## STRATIGRAPHIC DISTRIBUTION OF LITHIC DEBITAGE

| | | | CHERT | | | OBSIDIAN | | | BASALT |
|---|---|---|---|---|---|---|---|---|---|
| Provenience | Depth -cms | UCLMA # | Whole flake | Fragments | Waste | Whole flake | Fragments | Waste | |
| S 6 E 6 NW¼ | Surface-10 | 2-61805 | 71 (73.4) | 583 (171.5) | 55 (31.2) | | 2 (0.8) | | |
| S 6 E 6 SW¼ | Surface-10 | 2-61811 | 18 (8.6) | 123 (34.3) | 9 (3.8) | | | 1 (0.8) | |
| S 6 E 6 SE¼ | Surface-10 | 2-61815 | 5 (3.3) | 16 (4.5) | 3 (1.4) | | | | |
| S 6 E 4 SE¼ | 0-10 | 2-61912 | 64 (71.5) | 279 (197.4) | 25 (16.7) | | | | |
| S 6 E 6 SE¼ | 10-20 | 2-61817 | 13 (14.6) | 294 (65.1) | 19 (9.1) | 1 (1.9) | 3 (0.2) | | 1 (0.5) Fragment |
| S 6 E 6 SW¼ | 10-20 | 2-61823 | 23 (27.5) | 265 (75.5) | 18 (24.5) | 1 (0.6) | | | 1 (0.6) Whole fl. |
| S 6 E 6 NE¼ | 10-20 | 2-61829 | 57 (52.5) | 752 (217.2) | 64 (24.3) | | | | |
| S 6 E 6 NW¼ | 10-20 | 2-61833 | 61(139.2) | 798 (276.4) | 67(116.9) | 1 (0.4) | 1 (0.6) | | |
| S 6 E 4 SE¼ | 10-20 | 2-61917 | 21 (26.0) | 114 (60.5) | 9 (51.6) | | 2 (1.5) | | |
| S 6 E 6 SE¼ | 20-30 | 2-61841 | 19 (27.3) | 145 (58.0) | 9 (13.2) | 2 (1.1) | | | |
| S 6 E 6 SW¼ | 20-30 | 2-61848 | 21 (27.1) | 57 (35.0) | 8 (7.1) | 3 (3.3) | 3 (2.4) | | |
| S 6 E 6 NW¼ | 20-30 | 2-61851 | 11 (10.0) | 142 (52.0) | 14 (2.9) | 3 (3.4) | 9 (3.0) | | |
| S 6 E 6 NE¼ | 20-30 | 2-61862 | 23 (37.1) | 581 (189.6) | 41 (21.6) | | 5 (2.2) | | |
| S 6 E 4 SE¼ | 20-30 | 2-61924 | 1 (3.5) | 17 (20.8) | 2 (8.8) | | 1 (1.0) | | |
| S 6 E 6 SE¼ | 30-40 | 2-61866 | 29 (42.5) | 297 (154.0) | 31 (18.5) | | | | |
| S 6 E 6 NE¼ | 30-40 | 2-61868 | 27 (47.6) | 303 (197.8) | 18 (21.5) | 1 (1.0) | 1 (0.5) | | |
| S 6 E 4 SE¼ | 30-40 | 2-61927 | 7 (5.3) | 23 (21.2) | 1 (0.5) | | | | |
| S 6 E 6 SW¼ | 30-50 | 2-61874 | 19 (15.6) | 152 (45.1) | 13 (12.3) | 1 (1.5) | 6 (1.6) | | |
| S 6 E 6 NW¼ | 30-50 | 2-61879 | 16 (20.2) | 100 (43.6) | 4 (1.9) | | | | |
| S 6 E 4 SE¼ | 40-50 | 2-61932 | 13 (20.1) | 38 (25.6) | 6 (3.1) | | | | |
| S 6 E 6 SE¼ | 50-60 | 2-61884 | 80 (54.5) | 503 (86.3) | 42 (17.2) | | | | |
| S 6 E 6 SW¼ | 50-60 | 2-61896 | 12 (9.4) | 60 (19.3) | 6 (1.7) | 3 (0.2) | 2 (1.0) | | |
| S 6 E 6 NW¼ | 50-60 | 2-61901 | 6 (3.1) | 36 (21.0) | | | | | |
| S 6 E 6 NE¼ | 50-60 | 2-61905 | 37 (32.5) | 246 (40.5) | 31 (8.3) | | | | |
| S 6 E 4 SE¼ | Level 6 | 2-61939 | 3 (0.6) | 13 (6.0) | 1 (10.2) | | | | |
| S 6 E 4 SE¼ | Level 7 | 2-61944 | | 4 (13.5) | | | | | |

Depth measurements are in centimeters below surface, numbers in parentheses (00.0) are the weight in grams of the debitage specimens.

TABLE 8

PAINTED CAVE

SUMMARY STRATIGRAPHIC DISTRIBUTION OF LITHIC DEBITAGE

DISTURBED STRATA: ( A, Cow Feces Layer, B, C, D, E, F) ca. surface - 50 cm BS.
UNDISTURBED STRATA: ( G, H) ca. 50 - 70 cm BS.

| | C H E R T | | | O B S I D I A N | | | B A S A L T | |
|---|---|---|---|---|---|---|---|---|
| Provenience | Wh. Flakes | Fragments | Waste | Wh. Flakes | Fragments | Waste | Wh. Flakes | Frags. |
| Disturbed: | 519(8.6%) | 5079(83.8%) | 416(6.9%) | 13(0.2%) | 33(0.5%) | 1(.02%) | 1(.02%) | 1(.02%) |
| /weight/ | 672.9<br>(22.2%) | 1945.1<br>(64.0%) | 390.9<br>(12.9%) | 13.2<br>(0.4%) | 13.8<br>(0.5%) | 0.8<br>(.01%) | 0.6<br>(.01%) | 0.5<br>(.01%) |
| Undisturbed: | 138(12.7%) | 862(79.4%) | 80(7.4%) | 3(0.3%) | 2(0.2%) | | | |
| /weight/ | 100.1<br>(30.8%) | 186.5<br>(57.3%) | 37.4<br>(11.5%) | 0.2<br>(.06%) | 1.0<br>(0.3%) | | | |
| Total | 657(9.2%) | 5941(83.1%) | 496(6.9%) | 16(0.2%) | 35(0.5%) | 1(.01%) | 1(.01%) | 1(.01%) |
| /weight/ | 773.0<br>(23.0%) | 2131.6<br>(63.4%) | 428.3<br>(12.7%) | 13.4<br>(0.4%) | 14.8<br>(0.4%) | 0.8<br>(.02%) | 0.6<br>(.02%) | 0.5<br>(.02%) |

| | | | |
|---|---|---|---|
| Total Chert Debitage | = 7094(99.2%) | /weight chert debitage/ | = 3332.9(99.1%) |
| Obsidian Debitage | = 52(0.7%) | /weight obsidian debitage/ | = 29.0( 0.9%) |
| Basalt Debitage | = 2(0.03%) | /weight basalt debitage/ | = 1.1(0.01%) |
| Grand Total | = 7148 | | = 3363.0 |

(elevation, ecological setting, proximity to specific resources, etc.) archaeologists must 'start somewhere' if we are to ever discover the changing adaptive strategies employed by Great Basin groups through the Holocene. Quantitative analysis of manufacturing debris from any stratified cave/rockshelter/open site deposits or temporally discrete surface scatters can provide archaeology with a view on the nature of technological change and the nature of human adaptation in response to various ecological, cultural and temporal variables as it is through culture (and technology) that man interfaces and adapts to the environment.

At Painted Cave we have an opportunity to analyze a temporally discrete assemblage of lithic workshop debitage. Although at this writing radiocarbon dates are not yet available, the assemblage of debitage can be dated to the later prehistoric period based on the almost exclusive presence of Desert Side Notched and Cottonwood Triangular (and one Eastgate specimen) projectile points, and can be considered roughly contemporaneous with the assemblage reported from the Pink Point Site. Following the whole flake attribute analysis a brief comparison of the two assemblages will be made.

WHOLE FLAKE ANALYSIS

An attribute analysis of the whole flake component of the lithic debitage recovered from the Undisturbed Strata was carried out in order to determine the nature and characteristics of manufacturing activites conducted at the site. Initially all lithic debitage was segregated according to raw material (chert, obsidian, and basalt) and debitage category (whole flakes, flake fragments, and angular waste) for both the Disturbed Strata and Undisturbed Strata. Results of the analysis of Disturbed Strata lithic debitage are summarized in Tables 7 and 8. The whole flakes and fragments recovered from the Undisturbed Strata were further sorted into flake categories (primary cortex, secondary cortex and interior flakes) as presented in Table 9 (Lithic Debitage - S6E6/S6E4, Vegetal Layer and Living Floor (G,H) 50-70 cm). Finally, a detailed attribute analysis of all the recovered whole flakes from the Undisturbed Strata was carried out. Prior to the presentation of the results of the whole flake attribute analysis it is necessary to clarify the terminology used in this study.

TABLE 9

LITHIC DEBITAGE - S 6 E 6 / S 6 E 4
Vegetal Layer and Living Floor
50 - 70 cms

| Unit | Quad | Depth | UCLMA# | Whole Flakes | Flake Fragments | Primary Cortex | Second. Cortex | Interior | Raw Mat. |
|---|---|---|---|---|---|---|---|---|---|
| S6E6 | SE | 50-60 | 2-61884 | | 503 | 0 | 20 | 483 | Chert |
| | | | | 77 | | 1 | 12 | 64 | Chert |
| S6E6 | SW | 50-60 | 2-61896 | | 2 | 0 | 1 | 1 | Obs. |
| | | | | 3 | | 0 | 0 | 3 | Obs. |
| | | | | | 60 | 0 | 2 | 58 | Chert |
| | | | | 12 | | 0 | 3 | 9 | Chert |
| S6E6 | NW | 50-60 | 2-61901 | | 36 | 0 | 2 | 34 | Chert |
| | | | | 6 | | 0 | 2 | 4 | Chert |
| S6E6 | NE | 50-60 | 2-61905 | | 246 | 1 | 5 | 240 | Chert |
| | | | | 37 | | 0 | 5 | 32 | Chert |
| S6E4 | SE | Lev.6 | 2-61939 | | 13 | 0 | 1 | 12 | Chert |
| | | | | 2 | | 0 | 0 | 2 | Chert |
| S6E4 | SE | Lev.7 | 2-61944 | | 4 | 0 | 1 | 3 | Chert |

Key: Raw Mat. = Raw Material, Obs. = Obsidian

DEFINITIONS

1. Whole Flakes - Whole flakes must have a reasonably intact striking platform (except where the platform is shattered), have nearly complete edges sufficient to measure the maximum length, width, thickness, etc. of the specimen (cf. Crabtree 1972:64).

2. Flake Fragments - Flake fragments are pieces of flakes, either proximal, medial, distal or lateral fragments being present and can be recognized as being flakes by the presence of characteristic flake morphology (cf. Crabtree 1972 and Hester 1971).

3. Waste - Waste, or angular waste includes all miscellaneous chips, angular splinters and amorphous chunks which are the by-products of lithic manufacturing processes (cf. Deacon 1969).

4. Primary Cortex Flakes - These are 'decortification' flakes, whose dorsal surfaces are entirely covered with cortex. These are often called 'initial cortex flakes' by various authors (Hester 1971 and Shafer 1969).

5. Secondary Cortex Flakes - These flakes are partially covered with cortex on the dorsal surface and have one or more flake scars on the dorsal surface indicating previous cortex flake removals (cf. Hester 1971 and Shafer 1969).

6. Interior Flakes - These flakes are struck from the interior regions of a core, or a bifacial blank or preform from which all cortex has been removed. Thus, interior flakes have no nodular cortex remaining on the dorsal surface and will usually exhibit some flake scars from earlier flake removals on the dorsal surface (cf. Hester 1971 and Shafer 1969).

7. Biface Thinning Flakes - Flakes which have multifacetted striking platforms, diffuse bulbs of percussion, and pronounced lips where the platform and the ventral surface intersect are referred to here as biface thinning flakes. Hester (1971) and Shafer (1969) call these lipped flakes. Dorsal surfaces usually exhibit multiple flake scars and sometimes small areas of cortex as well. Most are thin in cross section, broad in outline and are probably due to the use of a billet (cylinder hammer) of a material softer than the material being worked (cf. Epstein 1969). It should be noted that biface thinning flake attributes can be quite variable, especially with respect to the number of facets on the striking platform.

8. Soft Hammer Retouch Flakes - Although it is rather simple to

distinguish between flakes produced from hard hammer percussion blows to a core, from biface thinning flakes on the basis of metric and morphological attributes, it is not easy to distinguish between biface thinning flakes and trimming/ sharpening flakes produced by retouch (usually with a soft hammer) of unifacial and bifacial artifacts ('knives,' scrapers, etc.). Those flakes which can not be classified as biface thinning flakes are thus classified as soft hammer retouch flakes for the purposes of this analysis. It should be noted that recent lithic experiments by Patterson and Sollberger (1978:108) revealed that biface thinning flakes made by soft hammer percussion were not always lipped and that lipped flakes are not a reliable guide to whether biface thinning techniques have been used. They further caution that attributes commonly measured are not always sufficient to identify force (hard or soft hammer percussion, pressure etc.) application techniques.

9. Pressure Flakes - These are usually small retouch flakes removed by a pressing force rather than by percussion (cf. Crabtree 1972:85).

10. Maximum Width Position - This is a designation of the point of maximum lateral dimension along a three step scale or the location of the maximum lateral dimension in terms of three regions of the flake; proximal, medial and distal (cf. Wilmsen 1970:14).

Striking Platform Types

1. Plain-Simple - This has been defined by Epstein (1969:72) as a platform that exhibits a relatively flat, smooth surface, without cortex.

2. Cortex - These are similar to plain-simple platforms except there is cortex present on the platform.

3. Two-Facetted - These have two flake facets evident on the platform from either a transverse direction or from a lateral direction (cf. Wilmsen 1970:Fig. 3f).

4. Multifacetted - These have more than two flake facets on the striking platforms.

5. Shattered - This is a catchall category for obscured platforms. Some have been obscured by later thinning or removal of the platform, or were shattered off when the flake itself was detached from the parent material. Those platforms showing any abrasion or crushing (cf. Wilmsen 1970:Fig. 4) are included here as well.

Length/Width Ratio - This is the index ratio obtained by dividing the length of a flake by its width. Narrow flakes are those flakes which have a L/W ratio range of 2/1 - 1.5/1. Flakes with a L/W ratio range of 1.5/1 to 1/1 are called equant flakes, and subequant flakes have a ratio range of 1/1 to 0.67/1. Wide flakes are those flakes with a ratio less than 0.67/1. Wide blades are those that have a L/W ratio range from 3/1 to 2/1 (cf. Fekri 1972:21). Generally, flakes with a L/W ratio of 1/1 or greater are end struck flakes, while those with L/W ratios of less than 1/1 are side struck flakes. For an example of this type of analysis from a Great Basin lithic assemblage, see Busby, Bard and Clark (In press). For the purposes of the Painted Cave analysis only notation is made to a flake being end or side struck.

Angle Alpha - This is the angle formed between the axis of percussion ( a line drawn perpendicularly to the striking platform at the point of impact) and the medial axis of the flake (cf. Wilmsen 1970:14 for a thorough discussion and demonstration of how angle alpha is measured).

Angle Beta - This is the angle formed between the plane of the striking platform and the plane of the ventral flake surface (cf. Wilmsen 1970:14). Angles alpha and beta are measured on a polar grid to the nearest two degrees.

Outline - This is an ad-hoc definition for the convenience of presenting the relative abundances of end versus side struck flakes. It is recommended that for a detailed analysis of flake outline, the categories described above for Length/Width ratios be utilized to describe flake outline and overall shape.

Flake Termination - This denotes how a flake terminates at the distal end and lateral edges. Terminations are usually feathered (a thin sharp edge), or hinged, abrupt or stepped (cf. Crabtree 1972).

Edge Damaged - Edge damage versus utilization is discussed elsewhere in this report. Flakes were examined for the presence or absence of edge damage. It is assumed that edge damaged flakes are just that, edge damaged and not possibly utilized, otherwise almost half of the recovered lithic debitage would 'qualify' as being possibly utilized as a tool which is most unlikely.

## ANALYSIS

A total of 137 whole flakes were recovered from the Undisturbed Strata and were subjected to a detailed attribute analysis. Of these 137 whole flakes, only 3 (2.2%) were obsidian while 134 (97.8%) were chert. No basalt whole flakes were recovered from the Undisturbed Strata. Of the 134 chert whole flakes, 26 (19.4%) are flakes derived from cores while 71 whole flakes (52.9%) are biface thinning flakes. Twenty-eight (20.9%) are soft hammer retouch flakes (usually associated with the processes of sharpening bifacial and other unifacial tools and with the fine finishing of chipped stone artifacts) and nine specimens (6.7%) are pressure flakes. Of the three obsidian whole flakes recovered, two are soft hammer retouch flakes and one is a pressure flake.

As a rule, few pressure flakes and soft hammer retouch flakes are also either primary or secondary cortex flakes. At Painted Cave, out of 28 soft hammer retouch flakes and 9 pressure flakes, only one specimen from each category were on secondary cortex flakes, the majority being on interior flakes. Of the 71 biface thinning flakes 61 (86%) were on interior flakes with a small minority, 10 (14%) on secondary cortex flakes.

Each of the 137 whole flakes were subjected to an attribute analysis which included: measurement of the flake length, width, thickness, striking platform length and width, measurement of angles alpha and beta, determination of the maximum width position, the length/width ratio and flake outline, the type of striking platform, the kind of flake termination and the presence or absence of edge damage. As well, each flake was categorized into the proper category depending on the amount of cortex present and whether or not it was derived from a core, the thinning of a biface, soft hammer retouch or pressure flaking. The results of the attribute analysis are presented in Tables 10-15 (Painted Cave - Whole Flake Analysis).

The analysis of the chert core flakes revealed that progressing from the early stages of manufacture (decortification) to the later stages (production of interior flakes), the produced flakes get smaller in length, width and thickness. They are also generally end struck and have their maximum width generally in the proximal or medial regions of the flake. There seems to be no significant differences between the secondary cortex and interior flakes with respect to striking platform length and width. With the secondary cortex flakes, the plain-simple platform is most common, whereas with interior flakes, the two facetted and multifacetted combined are somewhat more common than plain-simple platforms. The majority of flakes terminate in a feather edge with 50% of the secondary cortex flakes being edge damaged while less than half of the interior flakes are edge damaged. The secondary cortex flakes are about equally end struck and side struck while the interior flakes are most often side struck by a factor of 2/1. The angle alpha and beta measurements are almost identical between both groups.

The analysis of the chert biface thinning flakes indicates that progressive flaking results in decreasing length, width, length/width ratios, thickness and striking platform length and width. For secondary cortex flakes the maximum width position is evenly distributed among the proximal, medial and distal regions of the flakes while interior flakes, the maximum width position is split with the medial region being as common as both proximal and distal regions combined. Platform types as seen on secondary cortex flakes are mostly cortex and plain-simple while interior flakes have no cortex platforms and have a majority of plain-simple followed by two and multifacetted and shattered platforms. The majority of flake terminations are feather with all the secondary cortex being end struck while interior flakes are both end struck and side struck. Both groups are about equally edge damaged and have similar angle beta measurements. Angle alpha for secondary cortex flakes is twice as much as for interior flakes.

The analysis of the chert and obsidian soft hammer retouch flakes and pressure flakes is presented in Tables 12-15 and will not be discussed here. When compared with each other, chert core flakes and chert biface thinning flakes are quite different. The attribute analysis revealed that chert core flakes are longer, wider, thicker, have lower length/width ratios (are more likely to be side struck), have their maximum width positions more proximal and medial than biface thinning flakes which are widest mostly in the medial to distal regions, have longer and wider striking platforms than do biface thinning flakes but are about equally edge damaged and have similar angle beta measurements. This is surprising because generally angle beta reflects well the acute striking platform angles of bifaces. The range of angle beta measurements (Table 11) show that although on the average the angle beta measurements are the same, in fact, there are more acute angled specimens in the biface thinning flake population as one would expect. The angle alpha measurements show that core flakes are more skewed off center than are biface thinning flakes. The platform types are interesting because both groups are similar in their relative proportions of plain-simple, two facetted and multi-facetted platforms while the biface thinning flakes have a high proportion of shattered platforms. One would expect a greater proportion of multifacetted platforms in the biface thinning group.

Comparison of the Pink Point Site (cf. Busby, Bard and Clark, In press) chert whole flake assemblage against the Painted Cave chert whole flake assemblage shows few differences and many similarities. In general, with respect to the core versus biface thinning attributes, the greater length, width, thickness, measurements of core flakes are similar. However, with angle beta, the Pink Point assemblage clearly reveals a difference between the core and biface thinning flakes - the biface thinning flakes at Pink Point being very acute (ca. $16^{o}$). At Pink Point the numbers of multifacetted striking platforms were greater for biface thinning flakes than for core flakes and this conforms more to the expected norm for these kinds of flakes. At Pink Point, almost 80% of both core and biface thinning flakes were edge damaged, a higher proportion than at Painted Cave.

Whether these differences are due to the rather small populations of flakes analyzed from both sites or from actual culturally conditioned differences in manufacturing techniques, or motor habits of the knappers is uncertain and would require much further study. Overall the whole flake analysis of the Painted Cave specimens demonstrates a greater emphasis on biface thinning, artifact sharpening and pressure flaking of bifacial artifacts (knives, projectile points, bifaces etc.) than on the production of flakes from cores. This emphasis may not be valid for the site as a whole as it must be emphasized that this population of flakes were only the undamaged flakes (Whole Flakes) from the Undisturbed Strata (15.2% of all recovered lithic debitage). As such, the analysis can only be considered applicable to a finite area of the site in terms of time and space. As pointed out earlier, the value of this attribute analysis at both Painted Cave and Pink Point, is primarily as a demonstration of one of the steps that must be taken to begin to quantify the lithic technological processes and traditions practiced in the Great Basin over time. Both the Pink Point and Painted Cave analyses, inspite of their few differences, show much similarity of technology as practiced in late prehistoric/contact times (Cottonwood, Desert Side Notched)

TABLE 10

PAINTED CAVE - WHOLE FLAKE ANALYSIS

Chert Core Flakes

N = 26

| | 1 - Primary Cortex, | 10 - Secondary Cortex, | 15 - Interior Flakes |
|---|---|---|---|
| Length | 2.9 | 1.5 - 4.2 $\bar{X}$= 2.37 | 0.9 - 3.8 $\bar{X}$= 1.75 |
| Width | 2.5 | 1.0 - 2.8 $\bar{X}$= 2.00 | 1.2 - 4.5 $\bar{X}$= 1.93 |
| Length/Width | 1.16 | 0.63- 2.00 $\bar{X}$= 1.25 | 0.56- 2.50 $\bar{X}$= 1.00 |
| Thickness | 0.6 | 0.3 - 0.8 $\bar{X}$= 0.47 | 0.2 - 0.9 $\bar{X}$= 0.40 |
| M.W.P. | M | P-3, M-5, D-2 | P-6, M-7, D-2 |
| Platform L. | 0.6 | 0.5 - 1.8 $\bar{X}$= 1.1 | 0.4 - 2.9 $\bar{X}$= 1.11 |
| Platform W. | 0.4 | lt 0.1 - 0.6 $\bar{X}$= 0.36 | 0.1 - 0.8 $\bar{X}$= 0.35 |
| Platform Type | PS | C-3, PS-6, TF-1 | PS-6, TF-3, MF-5, SH-1 |
| Flake term. | A | A-2, F-8 | F-14, H-1 |
| Outline | ES | ES-6, SS-4 | ES-5, SS-10 |
| Edge damaged | - | 5/10 | 6/15 |
| Angle Alpha | 5 | 0 - 30 $\bar{X}$= 9.4 | 0 - 24 $\bar{X}$= 8.1 |
| Angle Beta | 70 | 50 - 90 X= 77.3 | 58 - 90 $\bar{X}$= 79.1 |

Length, Width, Thickness, Platform Length, Platform Width are measured in centimeters. Length/Width ratio is keyed into flake Outline: flakes whose Length/Width ratios are less than 1.0 are side struck flakes, while those with ratios greater than 1.0 are end struck flakes. M.W.P. = Maximum Width Position: P = proximal end of flake, M = medial area and D = distal area. Flake term. = Flake termination: A = abrupt termination, F = feather edge, H = hinge and S = step. Outline: ES = End struck, SS = Side struck. Edge damaged: - = not edge damaged, 5/10 = 50% are edge damaged, etc. Angle Alpha and Beta are measured in degrees. $\bar{X}$ = mean value.

NOTE: In cases where striking platforms are shattered (SH), the platform length and width are unknown.

Platform Type: C = cortex, PS = Plain/simple, TF = Two facets, MF = Multi-facetted, SH = Shattered.

TABLE 11

PAINTED CAVE - WHOLE FLAKE ANALYSIS

Chert Biface Thinning Flakes

N = 71

| | 10 - Secondary Cortex, | | 61 - Interior Flakes | |
|---|---|---|---|---|
| Length | 1.1 - 3.9 | $\bar{X}$ = 2.67 | 0.9 - 3.9 | $\bar{X}$ = 1.68 |
| Width | 0.8 - 2.5 | $\bar{X}$ = 1.71 | 0.6 - 2.3 | $\bar{X}$ = 1.35 |
| Length/Width | 1.05 - 2.78 | $\bar{X}$ = 1.65 | 0.67 - 2.67 | $\bar{X}$ = 1.33 |
| Thickness | 0.2 - 0.8 | $\bar{X}$ = 0.39 | 0.1 - 0.4 | $\bar{X}$ = 0.21 |
| M.W.P. | P-3, M-4, D-3 | | P-12, M-30, D-19 | |
| Platform L. | 0.2 - 1.3 | $\bar{X}$ = 0.69 | 1t 0.1 - 1.2 | $\bar{X}$ = 0.44 |
| Platform W. | 0.1 - 0.9 | $\bar{X}$ = 0.31 | 1t 0.1 - 0.5 | $\bar{X}$ = 0.15 |
| Platform Type | C-4, PS-4, TF-2 | | PS-30, TF-11, MF-9, SH-11 | |
| Flake term. | A-2, F-8 | | A-6, F-47, H-6, S-2 | |
| Outline | ES-10 | | ES-46, SS-15 | |
| Edge damaged | 4/10 | | 29/61 | |
| Angle Alpha | 0 - 22 | $\bar{X}$ = 10.8 | 0 - 30 | $\bar{X}$ = 5.5 |
| Angle Beta | 65 - 85 | $\bar{X}$ = 74.0 | 35 - 90 | $\bar{X}$ = 79.5 |

TABLE 12

PAINTED CAVE - WHOLE FLAKE ANALYSIS

Chert Soft Hammer Retouch Flakes

N = 28

| | 1 - Secondary Cortex | 27 - Interior Flakes | |
|---|---|---|---|
| Length | 0.5 | 0.5 - 1.8 | $\bar{X}$ = 0.88 |
| Width | 1.0 | 0.5 - 1.4 | $\bar{X}$ = 0.76 |
| Length/Width | 0.50 | 0.54 - 3.00 | $\bar{X}$ = 1.26 |
| Thickness | 0.2 | 0.1 - 0.2 | $\bar{X}$ = 0.12 |
| M.W.P. | D | P-3, M-11, D-13 | |
| Platform L. | lt 0.1 | lt 0.1 - 0.6 | $\bar{X}$ = 0.20 |
| Platform W. | lt 0.1 | lt 0.1 - 0.2 | $\bar{X}$ = 0.11 |
| Platform Type | C | PS-19, TF-3, MF-1, SH-4 | |
| Flake term. | F | A-1, F-25, H-1 | |
| Outline | SS | ES-17, SS-10 | |
| Edge damage | - | 6/27 | |
| Angle Alpha | 0 | 0 - 20 | $\bar{X}$ = 4.1 |
| Angle Beta | 70 | 71 - 89 | $\bar{X}$ = 83.3 |

TABLE 13

PAINTED CAVE - WHOLE FLAKE ANALYSIS

Chert Pressure Flakes

N = 9

| | 1 - Secondary Cortex | 8 - Interior Flakes | |
|---|---|---|---|
| Length | 0.5 | 0.5 - 0.8 | $\bar{X}$ = 0.61 |
| Width | 0.5 | 0.4 - 0.7 | $\bar{X}$ = 0.49 |
| Length/Width | 1.00 | 0.71 - 1.60 | $\bar{X}$ = 1.31 |
| Thickness | 0.1 | lt 0.1 - 0.1 | |
| M.W.P. | M | P-1, M-4, D-3 | |
| Platform L. | lt 0.1 | lt 0.1 - 0.3 | |
| Platform W. | lt 0.1 | lt 0.1 - 0.1 | |
| Platform Type | C | PS-5, MF-1, SH-2 | |
| Flake term. | F | F-8 | |
| Outline | ES | ES-7, SS-1 | |
| Edge damage | - | 1/8 | |
| Angle Alpha | 0 | 0 - 10 | $\bar{X}$ = 2.5 |
| Angle Beta | 89 | 70 - 90 | $\bar{X}$ = 81.1 |

TABLE 14

PAINTED CAVE - WHOLE FLAKE ANALYSIS

Obsidian Soft Hammer Retouch Flakes

N = 2

2 - Interior Flakes

| | | |
|---|---|---|
| Length | 0.9 - 0.9 | $\bar{X}$ = 0.9 |
| Width | 0.5 - 0.6 | $\bar{X}$ = 0.55 |
| Length/Width | 1.50 - 1.80 | $\bar{X}$ = 1.65 |
| Thickness | 0.1 - 0.1 | $\bar{X}$ = 0.1 |
| M.W.P. | M-2 | |
| Platform L. | 0.1 - 0.2 | $\bar{X}$ = 0.15 |
| Platform W. | lt 0.1 - lt 0.1 | |
| Platform Type | PS-2 | |
| Flake term. | F-2 | |
| Outline | ES-2 | |
| Edge damage | 1/2 | |
| Angle Alpha | 0 - 10 | $\bar{X}$ = 5 |
| Angle Beta | 80 - 85 | $\bar{X}$ = 82.5 |

TABLE 15

PAINTED CAVE - WHOLE FLAKE ANALYSIS

Obsidian Pressure Flakes

N = 1

1 - Interior Flake

| | |
|---|---|
| Length | 0.6 |
| Width | 0.5 |
| Length/Width | 1.20 |
| Thickness | 0.1 |
| M.W.P. | M |
| Platform L. | unknown |
| Platform W. | unknown |
| Platform Type | SH |
| Flake term. | F |
| Outline | ES |
| Edge damage | 1/1 |
| Angle Alpha | 0 |
| Angle Beta | 80 |

at small, intermittently occupied seasonal camps.

MACROBOTANICAL

Macrobotanical samples were collected from each level where present as part of the general excavation strategy. These have not yet been identified by a trained botanist. An inspection of the recovered materials indicates the presence of pinyon nut hulls (*Pinus monophylla*) and sagebrush (*Artemisia sp.*). Detailed inspection and identification by a botanist would provide additional data on both non-cultural and aboriginal utilization of plants in the region.

FAUNAL REMAINS (Appendix I)

The faunal remains indicate that bighorn sheep (*Ovis canadensis*) and deer (*Odocoileus hemionus*) along with various small mammals were the main hunted animals present at Painted Cave. In early historic times it is possible that *Bos taurus* (cow) was added as a new 'hunted' food item although the evidence at the site is very weak for this conclusion.

The animals were killed and processed in the near vicinity of the site with butchered portions brought back to the shelter for consumption. The quantity of faunal remains and the size of the site suggests occupation by a small group during the non-winter months of the year.

SUMMARY/INTERPRETATIONS

Although only 5% of the main occupation area of Painted Cave was professionally excavated, some preliminary interpretations are presented. Painted Cave was utilized by either late-prehistoric Northern Paiute or Shoshonean small bands/family groups as a seasonally occupied temporary camp. The site was probably visited at various times of the year except winter, to carry out various hunting and gathering activities including the hunting of such large and small mammals as *Ovis*, *Odocoileus*, *Sylvilagus*, *Lepus*, *Neotoma*, and *Citellus*, and the gathering of various riparian and surrounding desert vegetal resources. Pinyon nuts (*Pinus monophylla*), gathered in the nearby Stillwater Range, were brought to the site and consumed. Analysis of the artifact and lithic debitage assemblages revealed further evidence that the site was utilized as a temporary camp where maintenance activities, as opposed to home base activities, were carried out.

That is; primary lithic procurement and manufacturing occurred away from the site and for the most part, only secondary and tertiary workshpo activities were performed (e.g. biface sharpening, projectile point manufacture, etc.). As well, hunting and preliminary butchering was carried out away from the site and only selected portions of game carcasses were brought back to the site for further processing and eventual consumption. Artifacts usually associated with home base activities such as basketry/textiles and related tools, perishable goods and related tools for their manufacture, ground stone industry heavy duty primary processing implements, etc., were few in number or not present at all (preservation in the deposits was variable).

The single living floor suggests that at least one of the seasonal visits was intensive in nature, however whether the occupation was short or long term, cannot be determined. Chronologically this late Medithermal site dates from ca. 1400 A.D. to the late prehistoric or possibly into the historic period (See Appendix VII - Radiocarbon Dates). Desert Side Notched, Cottonwood Triangular and Eastgate projectile points were recovered. The presence of such a large number of thematically related pictographs suggests that this site was the locus of at least two periods of intensive hunting ritual activity (the designs are either quite faded or sharply defined).

In summary, the site can be interpreted as a seasonally occupied temporary camp utilized by either the late prehistoric Northern Paiute or Shoshone peoples. Future research at the site would add measurably to our interpretations and hypotheses concerning Painted Cave.

FOR NUMBER SEQUENCE ONLY

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# APPENDIX I

## Faunal Analysis

by

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Due to the badly disturbed nature of the deposit discussion of the unmodified faunal remains is divided into two parts, the Disturbed Strata and the Undisturbed Strata. Excavation grids S6 E6 and S6 E4 are combined in the analysis. The skeletal material is further sub-divided into its particular stratum except for the Disturbed Strata. These deposits are detailed by both associated stratum and approximate 10 cm depth.

Table 1 is a summary of the number of bones recovered from the Painted Cave excavations. Table 2 lists the identified species. For each stratum the faunal elements per species or faunal category for unidentified mammals (small mammal-up to a cottontail in size; medium mammal-up to a coyote/bobcat; large mammal-deer, sheep, etc.) are listed. In addition, the minimum number of individuals per identified species are provided. Discussion of the bones per stratum(or strata) follow the element lists.

TABLE 1

Number of Bones-Painted Cave

| | |
|---|---|
| Disturbed Strata* (ca. 0-30 cm bs) | 2168(874 are burned) |
| Undisturbed Strata | |
| Stratum F(Alluvium 2, ca. 30-50 cm bs) | 308(34 are burned) |
| Strata G & H (Vegetation Layer & Living Floor, ca. 50-70 cm bs) | 194(8 are burned) |
| SITE TOTAL | 2670 |

0-10 cm bs had 163 bones(21 burned); 10-20 cm bs had 614 bones(99 burned); 20-30 cm bs had 1391 bones(754 burned)

## TABLE 2

### Recovered Species From NV-PE-40 Painted Cave

#### Small Mammals

| | |
|---|---|
| _Citellus beldingi_ | Belding Ground Squirrel |
| _Citellus lateralis_ | Golden Mantel Ground Squirrel |
| _Citellus townsendii_ | Townsend Ground Squirrel |
| _Citellus_ sp. | |
| _Dipodomys ordii_ | Kangaroo Rat |
| _Neotoma lepida_ | Desert Wood Rat |
| _Neotoma_ sp. | |
| _Peromyscus maniculatus_ | Deer Mouse |
| _Reithrodontomys megalotis_ | Western Harvest Mouse |
| _Sylvilagus nuttallii_ | Cottontail |
| _Spilogale gracilis_(?) | Spotted Skunk |
| _Thomomys talpoides_ | Northern Pocket Gopher |
| _Thomomys_ sp. | |

#### Medium Mammals

| | |
|---|---|
| _Lepus californicus_ | Black-tailed Jackrabbit |
| _Marmota flaviventris_ | Yellow-bellied Marmot |

#### Large Mammals

| | |
|---|---|
| _Antilocapra americana_(?) | Prong-horn Antelope |
| _Bos taurus_ | Cow |
| _Odocoileus hemionus_ | Deer |
| _Ovis canadensis_ | Bighorn Sheep |

#### Unidentified Species

| | |
|---|---|
| 0-10 cm bs | 1 bat mandible |
| 10-20 cm bs | 1 small fish vertebra, 1 small reptile mandible-left side, 3 small bird bones |
| 30-50 cm bs | 2 small bird bones |

### DISTURBED STRATA-ELEMENT LIST

0-10 cm bs Stratum A

| | | |
|---|---|---|
| _Citellus lateralis_ | 1 rt. mandible | 1 individual |
| _Lepus californicus_ | 1 femur head, 2 distal tibae(epiphyses unfused) | at least 2 individuals |
| _Neotoma lepida_ | 1 lt. mandible | 1 individual |
| _Sylvilagus nuttallii_ | 1 palate, 1 femur distal fragment | at least 1 individual |

0-10 cm bs Stratum A(continued)

| | | |
|---|---|---|
| *Antilocapra americana??* | 1 right $M_{1-2}$ | 1 individual |
| *Bos taurus* | 1 pelvic fragment, 5 pes(all burned) | 1 individual |
| Small mammals | 2 ribs, 1 caudal vertebra(epiphysis unfused), 1 rt. humerus fragment, 1 proximal femur, 47 limb bone fragments | |
| Medium Mammals | 1 molar fragment, 1 cranial fragment, 3 ribs, 1 distal radius, 1 phalange, 3 limb bone fragments | |
| Large Mammals | 1 fragmented vertebra(epiphysis unfused), 85 limb bone fragments(16 of these are burned) | |

10-20 cm bs Cow Feces Layer, Stratum B

| | | |
|---|---|---|
| *Citellus towsendii* | 2 $I^1$, $2M^{1-3}$, 1 rt. mandible, 1 lt. mandible, 3 rt. palate fragments, 1 lt. humerus epiphysis unfused), 2 lt. innominates | at least 3 individuals |
| *Lepus californicus* | 1 I, 7M, 1 premaxilla, 1 rt. scapula, 1 lt. ulna, 1 lt. humerus, 1 distal humerus(epiphysis unfused), rt. and lt. innominates,1 rt. distal tibia, 2 tibia midshaft fragments, 1 proximal tibia(epiphysis unfused), 1 rt. calcaneum, 2 phalanges | at least 2 individuals |
| *Neotoma* sp. | 1 lt. humerus (epiphysis unfused) | 1 individual |
| *Neotoma lepida* | 1 lt. mandible, 1 lt. innominate(immature), 2 lt. femora(epiphyses unfused) | at least 2 individuals |
| *Sylvilagus nuttallii* | 1 lt. mandible, 1 lt. innominate(immature), 2 rt. innominate(1 is immature), 1 proximal epiphysis unfused) | at least 2 individuals |
| *Bos taurus* | 2 I, 6 M fragments, 1 lt. mandible fragment, 2 vertebrae fragments, 1 thoracic vertebra(epiphysis unfused), 2 lumbar | 1 individual |

10-20 cm bs Cow Feces Layer, Stratum B(continued)

| | | |
|---|---|---|
| | vertebrae(epiphysis unfused), 13 rib fragments (2 are burned), 17 pelvic fragments, 1 distal femur fragment, 2 pes(1 burned), 4 phalange fragments, 36 limb bone fragments(15 burned) | |
| *Ovis canadensis* | 2 $M^{1-2}$, 1 lt. mandible | 1 individual |
| Small Mammals | 3 cranial fragments, 1 lumbar vertebra, 1 caudal vertebra, 3 ribs, 1 rt. scapula, 2 scapula fragments, 1 rt. ulna, 1 proximal ulna, 6 phalange fragments, 13 limb bone fragments | |
| Medium Mammals | 1 $P^3$ carnivore, 5 cranial fragments, 3 caudal vertebrae, 1 vertebra fragment, 7 rib fragments, 2 phalanges(epiphyses unfused), 25 limb bone fragments | |
| Large Mammals | 2 rib fragments(not *Bos*), 404 limb bone fragments (81 burned)(Most of these are probably *Bos*) | |

20-30 cm bs Stratum C, Stratum D

| | | |
|---|---|---|
| *Citellus* sp. | 1 lt. femur(epiphysis unfused) | 1 individual |
| *Citellus townsendii* | 1 rt. mandible | 1 individual |
| *Dipodomys ordii* | 1 lt. femur | 1 individual |
| *Lepus californicus* | 4 M, 1 I, 1 premaxilla 1 rt. scapula, 1 lt. ulna, 1 lt. humerus, 1 humerus distal(epiphysis unfused), 1 lt. innominate, 1 rt. innominate, 1 rt. distal tibia, 2 tibae mid-shaft fragments, 1 proximal tibia fragments(epiphysis unfused), 2 phalanges | at least 2 individuals |
| *Neotoma* sp. | 1 M | 1 individual |
| *Neotoma lepida* | 1 rt. mandible, 1 lt. humerus, 2 lt. innominate, 2 femora(both have epiphyses unfused), 1 rt. tibia (epiphysis unfused) | at least 2 individuals |

20-30 cm bs Stratum C, Stratum D(continued)

| | | |
|---|---|---|
| Sylvilagus nuttallii | 2 lt. mandibles(1 burned), 1 rt. mandible(burned), 2 lt. innominates(1 is immature), 1 lt. distal tibia, 1 tibia midshaft fragment, 1 phalange immature, 1 limb bone fragment | at least 3 individuals |
| Spilogale gracilis?? | 1 lt. mandible | 1 individual |
| Thomomys sp. | 1 lt. innominate | 1 individual |
| Thomomys talpoides | 1 rt. humerus(epiphysis unfused) | 1 individual |
| Bos taurus | 1 I fragment, 9 M fragments, 2 lt. mandibular fragments, 3 rt. mandibular fragments(1 is burned), 1 thoracic vertebra(immature), 1 caudal vertebra, 6 vertebrae fragmentsm 7 rib fragments, 1 rt. ulna, 1 pelvic fragment, 6 metapodial fragments(3 are immature, 2 are burned), 1185 limb bone fragments(737 burned) | at least 2 individuals |
| Ovis canadensis | 2 M fragments, 1 lt. ascending ramus and body of mandible(w/butchering marks), 1 rt. ascending ramus | 1 individual |
| Small Mammals | 1 palate, 1 palate fragment, 4 cranial fragments, 1 premaxilla, 1 thoracic vertebra fragment, 1 proximal ulna, 1 lt. innominate(immature), 2 phalanges, 19 limb bones(1 with epiphysis unfused) | |
| Medium Mammals | 2 caudal vertebrae, 1 vertebra fragment, 5 rib fragments, 1 tibia, 1 rt. astragalus, 2 phalanges, 2 limb bone fragments | |
| Large Mammals | 1 incisor, 1 rib fragment, 1 rt. scapula fragment(deer?), 70 limb bone fragments(12 are burned) | |

The excavated deposit, 0 to 30 cm below surface, is highly disturbed. Both humans and animals have dug into the original undisturbed surface. This makes analysis of the faunal remains very difficult. The data presented above is outlined in 10 cm levels only for convenience. The upper strata have been intensively disturbed by rodents. Separation of the data into stratigraphic layers, while preferred, is not completely possible for the first 30 cm of deposit. In addition, obvious human disturbance can be seen in the north wall profile of S6 E6. An intrusive pit is clearly seen in the profile.The disturbance is so pronounced that the Alluvium 1-Stratum B traced throughout much of S6 E6 is partially missing in S6 E4. Attempts to find Alluvium 1 in S6 E4 before and during wall profile work were only partially successful. Below is the list of recovered fauna for the ca. 0 to 30 cm depth. The individual count per species is tentative and based on the subjective judgement of the author. The following estimates should be viewed as conservative.

DISTURBED STRATA

| | |
|---|---|
| Citellus sp. | 1 individual |
| Citellus lateralis | 1 individual |
| Citellus townsendii | at least 3 individuals |
| Dipodomys ordii | 1 individual |
| Lepus californicus | at least 4 individuals |
| Neotoma sp. | 1 individual |
| Neotoma lepida | at least 3 individuals |
| Spilogale gracilis?? | 1 individual |
| Sylvilagus nuttallii | at least 3 or 4 individuals |
| Thomomys sp. | 1 individual |
| Thomomys talpoides | 1 individual |
| Antilocapra americana? | 1 individual |
| Bos taurus | at least 2 individuals |
| Ovis canadensis | 1 individual |

UNDISTURBED STRATA

Stratum F(Alluvium 2), 30 to 50 cm bs, is much less disturbed than the upper deposits. Within this depth, alluvium and deposits on top of and mixed with the upper portions of Stratum F, are remains which are best treated as representing one period of site occupation. Thus below are the faunal remains from pits S6 E6 and S6 E4 for the depth of ca. 30 to 50 cm below surface. The middle and lower portions of Alluvium 2 are culturally sterile. The faunal remains,below the Alluvium 2-Stratum F, contained in the Vegetation Layer (Stratum G) and the Living Floor(Stratum H) are combined as another unit of analysis. The element lists for Stratum F and the Vegetation Layer-Living Floor are outlined below.

30-50 cm bs Stratum F-Alluvium 2

| | | |
|---|---|---|
| Citellus beldingi | 1 lt. distal humerus | 1 individual |
| Citellus lateralis | 1 palate, 1 lt. mandible | 1 individual |
| Citellus townsendii | 1 lt. mandible | 1 individual |
| Dipodomys ordii | 1 rt. femur | 1 individual |
| Lepus californicus | 1 $I^1$, 2 M, 3 palate fragments, 1 lt. scapula fragment, 3 rt. scapula fragments, 1 scapula fragment, 1 lt. humerus, 1 humerus fragment, 1 lt. innominate fragment, 1 lt. tibia, 5 tibia midshaft fragments, 1 tibia fragment(immature), 1 femur head | at least 3 individuals |
| Marmota flaviventris | 1 lt. tibia(immature) | 1 individual |
| Neotoma lepida | 2 lt. mandibles, 1 rt. femur(epiphysis unfused) | at least 2 individuals |
| Sylvilagus nuttallii | 1 lt. palate | 1 individual |
| Bos taurus | 1 lumbar vertebra, 1 vertebra fragment, 4 rib fragments(3 are burned), 3 phalange fragments, 18 limb bone fragments | 1 individual |
| Odocoileus hemionus | 1 $P_{2-3}$, 1 $P_3$, 1 rt. mandible fragment(burned) | at least 1 individual |
| Ovis canadensis | 1 $P_3$, 1 M | 1 individual |
| Small Mammals | 11 cranial fragments, 1 cervical vertebra, 1 caudal vertebra, 1 lt. innominate, 1 rt. innominate, 1 sacrum fragment, 1 distal tibia, 1 phalange, 16 limb bone fragments | |
| Medium Mammals | 2 cranial fragments, 1 caudal vertebra, 1 vertebra fragment, 7 rib fragments, 2 rt. humeri(immature and 1 is burned), 1 phalange (immature), 24 limb bone fragments | |
| Large Mammals | 1 I and 1 P fragment, I enamel chip, 1 rib fragment(burned), 166 limb bone fragments(29 are burned) | |

The fauna from the upper portions of Alluvium 2-Stratum F is not extensive. There are very few bones to make or base any conclusions on. The occurrence of Bos may indicate that in aboriginal-historic time the cow was a food item. The evidence is not conclusive. It is just as likely that the Bos bones are intrusive from the above disturbed strata. Rodent activity continues 30-50 cm below surface though not as prominent as in the upper levels.

### Stratum G-Vegetation Layer & Stratum H-Living Floor

Below are the species from the Vegetation Layer and the Living Floor, 50 to 70 cm below surface. The middle and lower portions of Alluvium 2 are essentially culturally sterile. The alluvium 'capped' the Vegetation Layer and Living Floor. This thus represents the best undisturbed excavated deposit of the S6 E6 and S6 E4 grids. Unfortunately there were very few bones recovered from below Alluvium 2. There are several probable explanations for this, despite the obvious intensive use of the site during this time, i.e. the Living Floor.

1. The vegetation placed on the Living Floor probably contained most of the occupational refuse. This was most likely lying on the vegetation itself but the alluvium entering the shelter 'displaced' or washed away the top of the Vegetation Layer. The vegetation recorded to be on top of the Living Floor is not complete. It is only the remnant of the original vegetation. Thus any skeletal material originally lying on the vegetation was washed away. The occurrence of vegetation over the hearth area of the floor supports the view that the original Vegetation Layer was moved.
2. The introduction of alluvium into the shelter at varying times also, of course, introduced water. The water hastened the bone decomposition, thus as the deposit gets deeper fewer skeletal materials would be found.
3. The pits of S6 E6 and S6 E4 were excavated mainly because they were not as heavily vandalized as the rest of the site. The data which has been analyzed here may be biased, thus the occupational refuse may have already been 'excavated' by vandals. Despite the discovery of the Living Floor and associated hearth and associated Cottonwood Series projectile point it must be remembered that the portions excavated represent the 'left-overs' from the pothunters. The bias introduced into our analysis is incalculable.

50-70 cm bs Vegetation Layer-Stratum G and Living Floor-Stratum H

| | | |
|---|---|---|
| Citellus townsendii | 1 lt. mandible, 1 rt. mandible | 1 individual |
| Lepus californicus | 1 lt. palate | 1 individual |
| Neotoma sp. | 1 rt. innominate | 1 individual |
| Neotoma lepida | 1 rt. mandible, 1 lt. innominate, 2 lt. femora, 1 rt. femur(immature), 1 tibia fragment(immature) | at least 3 individuals |

50-70 cm bs Vegetation Layer-Stratum G and Living Floor-Stratum H (continued)

| | | |
|---|---|---|
| Peromyscus maniculatus | 1 lt. femur | 1 individual |
| Reithrodontomys megalotis | 1 lt. mandible | 1 individual |
| Sylvilagus nuttallii | 1 M, 1 rt. mandible | 1 individual |
| Ovis canadensis | 1 $P^4$ | 1 individual |
| Small Mammals | 1 I, 4 cranial fragments, 2 caudal vertebrae, 2 rib fragments, 1 lt. scapula fragment, 1 scapula fragment, 1 lt. innominate, 2 femora fragments, 1 tibia fragment, 2 phalanges, 47 limb bone fragments | |
| Medium Mammals | 1 thoracic vertebra fragment, 15 limb bone fragments | |
| Large Mammals | 1 upper P4(deer?), 2 M fragments, 1 rib fragment, 95 limb bone fragments(8 are burned)-these bones are very small and broken. | |

## Discussion

Viewed as a whole, the Painted Cave fauna is typical of the Upper Sonoran Lifezone(Hall 1946). Yet, the small quantity of recovered skeletal material makes detailed interpretation very difficult. Also 82% of all the excavated bones come from the Disturbed Strata, ca. 0-30 cm below surface. Still it can be concluded that the Bos taurus material on the surface and just below the the surface to a depth of 30 cm probably represent the activity of non-aboriginal people. However, the Bos bones from the upper portion of the Alluvium 2-Stratum F(30-50 cm below surface) mayindicate that aboriginal people did utilize the cow as a food item. The occurrence of cattle in the same stratum with Ovis and Odocoileus--documented as quarry in historical and prehistoric times(Steward 1938; Stewart 1941; Thomas 1969, 1972; Kobori 1976, in press; Seck, Kobori, and Covert 1978; among others)--lends support to the possibility that Bos was 'hunted' in early historic times(see Angel 1881; Layton 1970, 1977). The association of cow bones and aboriginal artifacts is very weak at Painted Cave. The Alluvium 2-Stratum F cattle bones could be intrusive from the overlying Disturbed Strata.

As stated earlier the Vegetation Layer lying on the Living Floor is not intact. In all probability any cultural material on the original vegetation was washed away with the subsequent higher water level(s). Thus the alluvium sealed and 'capped' the remaining Vegetation Layer and Living Floor. What skeletal material survived the flooding points to a primary focus on 1.) Ovis (possibly deer, too), 2.) a series of small mammals(Sylvilagus, Citellus, Neotoma) and 3.) a medium size mammal(Lepus). If we assume that the Living Floor is associated with a majority of the pictographs then the conclusion that large mammals were the desired object of the hunt is strengthened. Several pictographs exhibit(apparantly) large four-legged mammals. At least one of which is clearly similar to Bighorn Sheep petroglyphs(Heizer and Baumhoff 1962). While there are at least three Neotoma lepida individuals in the Vegetation Layer-Living Floor strata this does not mean that this animal was the focus of the hunt. Just one Bighorn Sheep can result in 100 pounds of usable meat(Kobori,in press). It would take approximately 477 N. lepida individuals to account for an equal number of pounds of usable meat(in addition, it cannot be determined whether all of the very small mammal remains represent a portion of a past human diet versus the normal fauna of the cave). Evaluating the importance of a species to the aboriginal diet cannot depend on just the number and weight of bones per species or the minimum number of individuals per species.

Keeping in mind the small number of bones and the bias introduced by excavating in one of the few, relatively non-vandalized areas of the site, the fauna from the Vegetation Layer-Living Floor strata(G and H) and the Alluvium 2 stratum(F) are very similar and point to a primary emphasis on large mammals supplemented by various small and medium mammals. Ovis, Odocoileus, Sylvilagus, Lepus, Neotoma, and Citellus form the nucleus of the aboriginal mammalian diet. In early historic times it is possible that the cow was added to the diet, though the evidence for this is very weak. Table 3 lists the pounds of usable meat per species by stratum and the % usable meat per species by stratum.

The occurrence of Citellus in the deposit is important for assessing when the site was utilized. The periods of estivation and hibernation limit the time when the animal can be hunted. Thus, according to Hall(1946), the squirrel would be active and hence available to hunters from approximately March to June/July. It cannot be assumed that it was equally available during every one of these months. Some months would be better than others. However, the Painted Cave data does not permit further refinement as to when the site was used. The cave was probably not occupied during the winter.

The skeletal elements recovered also indicate Painted Cave was not a primary processing site for animal kills. The location of the kill site is inferred to be in the nearby region. However, very little of the carcass was brought back to the site. In the Disturbed Strata the cattle were killed possibly just outside the cave itself. This being quite probably the activity of non-aboriginals. It is hypothesized that a small group of people periodically utilized the site for an undetermined length of time. The size of group based on the Vegetation Layer-Living Floor strata fauna could be as small as one or two nuclear families. The Alluvium 2 stratum(F) fauna would also support this conclusion. The mammalian quarry was killed and processed somewhat away from Painted Cave itself. Butchered portions of the kill (especially the large mammals) were brought back to the site.

The predominance of large mammals to the hunted portion of the diet may be related to the cave wall painting activity, though this cannot conclusively be proven. Still the co-occurrence of pictographs and the overwhelming dietary importance of Ovis at Painted Cave lends support to Heizer and Baumhoff's(1962) contention that the stylized paintings/ petroglyphs are somehow associated to the successful hunting of large mammals.

TABLE 3

Usable Meat Per Species(based on Kobori, in press)

| stratum & species | pounds usable meat | % usable meat |
|---|---|---|
| Alluvium 2-Stratum F | | |
| *Bos taurus* | 400.00 | 65.47 |
| *Ovis canadensis* | 100.00 | 16.37 |
| *Odocoileus hemionus* | 100.00 | 16.37 |
| *Sylvilagus nuttallii* | .78 | .13 |
| *Lepus californicus* | 6.78 | 1.11 |
| *Citellus*(all species) | 1.19 | .19 |
| *Marmota flaviventris* | 1.77 | .29 |
| *Neotoma lepida* | .42 | .06 |
| *Dipodomys ordii* | .07 | .01 |
| Vegetation Layer-Living Floor Stratum G & H | | |
| *Ovis canadensis* | 100.00 | 95.90 |
| *Sylvilagus nuttallii* | .78 | .75 |
| *Lepus californicus* | 2.26 | 2.17 |
| *Citellus townsendii* | .35 | .34 |
| *Neotoma lepida* | .63 | .60 |
| *Neotoma* sp. | .21 | .20 |
| *Peromyscus maniculatus* | .035 | .03 |
| *Reithrodontomys megalotis* | .014 | .01 |

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APPENDIX II

# Report on the Preliminary Palynological Analysis of Samples From Painted Cave, Nevada

BY

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## INTRODUCTION

Basin Research Associates submitted 13 palynological samples obtained from various stratigraphic layers present in the excavated units of Painted Cave for a preliminary pollen analysis. This preliminary report is primarily concerned with the presence/absence of pollen in the deposits, their state of preservation and the potential that may exist for further intensive palynological work at the site. As such, this report and its suggestions/ recommendations is necessarily of a brief nature and is limited to a presentation of the results and a few remarks on the interpretation of the data.

## METHODOLOGY

Thirteen samples from Painted Cave were prepared and examined for pollen content. All samples were prepared according to the following procedure.

1. Wash with distilled water. Centrifuge and decant.
2. 20% HCl for 5 minutes to remove carbonates. Centrifuge and decant.
3. Wash with distilled water. Centrifuge and decant.
4. 10% KOH, heated in hot water bath for 5 minutes to deflocculate. Centrifuge and decant.
5. Wash 2x with distilled water. Centrifuge and decant each time.
6. 50% HF, cold for 12-18 hours, then heated in hot water bath for 2 hours to remove silicates. Centrifuge and decant.
7. Wash with distilled water. Centrifuge and decant.
8. 30% $HNO_3$, cold for 3-5 minutes, to remove carbonates, sulfates and sulfides. Centrifuge and decant.
9. Wash with distilled water. Centrifuge and decant.
10. Rinse with glacial acetic acid to dehydrate. Centrifuge and decant.
11. Acetolysis (9 parts acetic anhydride:1 part $H_2SO_4$), heated in hot water bath for 5 minutes to remove cellulose. Centrifuge and decant.

12. Rinse with glacial acetic acid. Centrifuge and decant.
13. Wash with distilled water. Centrifuge and decant.
14. Stain with 1% Safranin O. Centrifuge and decant.
15. Tertiary Butyl Alcohol to dehydrate. Centrifuge and decant.
16. Mount in silicone oil (2000 cts.).

Although pollen was present in all 13 samples, two of the samples (D, 2-61960 and G, 2-61957) did not contain sufficient quantities of pollen to warrant detailed analysis and counting. The number of pollen grains counted in each of the remaining 11 samples are given in Table 1.

RESULTS/INTERPRETATIONS

Information regarding the relative stratigraphic positions of the samples was not available to the analyst. Therefore, data from the pollen counts have been presented in a table format (Table 1) rather than as a pollen diagram. The more commonly encountered pollen types are shown along with the indeterminate and unknown pollen grains from each sample. Pollen grains which were considered indeterminate are those which were broken or distorted beyond recognition. The number of indeterminates in a sample, of course, reflects the overall quality of pollen preservation in that sample. The Taxodiacrae/Cupressaceae/Taxaceae (TCT) type pollen is most likely that of *Juniperus*, although the pollen of these three families is similar and difficult to distinguish. Most genera of the Chenopodiaceae/Amaranthaceae (Cheno-Am) also have very similar pollen although *Sarcobatus* (Chenopodiaceae) is distinctive. Cheno-Ams are generally alkalai and salt-tolerant plants of the shadscale community. Those pollen types included as 'others' are those which were encountered infrequently in these samples and include *Abies*, *Alnus*, *Quercus*, Malvaceae and Cyperaceae. Table 1 presents the data for each identified pollen type as a percentage of the total identified pollen. The data presented for indeterminate and unknown pollen is a percentage of the total pollen count (including identified, unknown and indeterminate pollen types ).

RECOMMENDATIONS

The overall quality of pollen preservation in many of the samples was reasonably good. Further pollen analysis of samples from Painted Cave may be useful, especially if it can be shown that the length of time represented in the stratigraphic section is sufficient to allow for climatic change.

More detailed pollen analysis may also be of use for ethnobotanical interpretations.

## NOTES

(Comments added by Basin Research Associates Staff)

As can be seen from Table 1 the palynological results are variable to some degree. This is to be expected for a rockshelter where both cultural and natural processes are contributing and have contributed to the disturbance of the sediments. Differences between samples taken from the same stratigraphic layers are noticeable (e.g. Stratum F and Cow Feces Layer). Whether or not this is due to disturbance, selective dispersion of pollen, or to sampling methodology/analysis cannot be determined. In the case of the Cow Feces Layer with Leguminosae present, this is undoubtedly due to bovine transport of pollen.

Overall the percentage figures are reasonably 'consistent' implying no drastic paleoenvironmental changes from A.D. 600. Further pollen analysis coupled with both a detailed pedological examination of the sediments and radiocarbon dates would contribute significantly to the environmental and depositional history of the shelter.

## TABLE I

| | PINUS * | LEGUMINOSAE ? * | TCT * | EPHEDRA * | ARTEMISIA * | AMBROSIA * | COMPOSITAE * | ONAGRACEAE * | GRAMINEAE * | CHENO-AM * | SARCOBATUS * | OTHERS * | INDETERMINATE ** | UNKNOWN ** | TOTAL NO. OF IDENTIFIED POLLEN GRAINS | TOTAL POLLEN GRAINS (IDENT. UNKNOWN, INDET.) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Stream Alluvium | 12.0 | - | 7.7 | 0.9 | 16.2 | - | 12.8 | 0.9 | 4.3 | 30.8 | 10.3 | 4.3 | 18.9 | 2.0 | 117 | 148 |
| A S6E6 | 13.1 | - | 7.4 | 0.8 | 3.3 | 0.8 | 2.4 | - | 5.7 | 55.7 | 8.2 | 2.5 | 7.1 | 6.4 | 122 | 141 |
| Cow Feces S6E6 | 11.5 | - | 3.9 | - | 13.4 | 1.9 | 6.7 | 1.0 | 1.0 | 53.9 | 6.7 | - | 11.6 | 2.5 | 104 | 121 |
| Cow Feces S6E4 | 5.7 | 48.3 | - | - | 2.8 | 3.4 | 0.6 | - | 4.0 | 22.7 | 5.7 | 6.8 | 6.8 | 0.5 | 176 | 190 |
| D S6E6 | 12.0 | - | 1.0 | 1.0 | 17.0 | - | 7.0 | - | 9.0 | 38.0 | 12.0 | 3.0 | 13.8 | 4.1 | 100 | 123 |
| F S6E6 | 17.0 | - | 7.7 | 0.9 | 5.1 | - | 15.3 | - | 3.4 | 47.9 | 1.7 | 0.9 | 29.8 | 4.5 | 117 | 178 |
| F S6E4 | 23.6 | - | 1.5 | 0.7 | 5.8 | - | 3.6 | - | 0.7 | 52.6 | 10.9 | 0.7 | 19.2 | 5.5 | 137 | 182 |
| F S6E4 | 14.9 | - | 9.7 | 1.5 | 11.9 | 0.7 | 6.0 | 2.2 | 0.7 | 44.0 | 4.5 | 3.7 | 10.2 | 14.1 | 134 | 177 |
| G S6E6 | 14.0 | - | 10.0 | - | 14.0 | - | 8.0 | 1.0 | 1.0 | 40.0 | 10.0 | 2.0 | 17.6 | 2.2 | 100 | 125 |
| H S6E4 | 18.6 | - | 8.8 | - | 7.1 | - | 5.3 | - | 1.8 | 54.0 | 3.5 | 0.9 | 18.5 | 4.1 | 113 | 146 |
| Charcoal Lens S6E4 | 21.7 | - | 5.6 | 0.6 | 10.6 | - | 8.7 | - | 1.2 | 42.2 | 7.5 | 1.9 | 8.2 | 3.3 | 161 | 182 |

* Percentage of Total Identified Pollen Grains

** Percentage of Total Pollen Grains (Including: Identified, Unknown and Indeterminate)

UCLMA #s: A = 2-61911, Cow Feces S6E6 = 2-61910, Cow Feces S6E4 = 2-61961, D = 2-61909, F = 2-61908, F = 2-61959, F = 2-61956, G = 2-61907, H = 2-61942, Charcoal Lens = 2-61958. Stream Alluvium, collected from the surface of the stream bed, has no UCLMA catalog number.

## APPENDIX III

## Pictographs

### INTRODUCTION

Thorough recordation and documentation of the Painted Cave pictographs was an integral part of the Bureau of Land Management contract provisions. Zoomorphic, anthropomorphic and curvilinear pictographs in red, yellow, orange and white pigments occur both on the back wall and in various niches/crevices at the rear of the shelter.

### METHODOLOGY

Conventional photographic techniques could not be utilized to give a complete record of the pictographs due to the difficult lighting conditions, the highly variable relief of the formation walls and the inability of the photographic medium to faithfully record on film the fine nuances of color, shading, superimposition, blurring etc. discernible to the eye. Inspite of these drawbacks a photographic record was made using color print and color transperancy films (cf. Fig. 1)[1].

To supplement the photographic record, full scale tracings utilizing thin (0.004") polyethylene sheeting and felt tip marking pens were made of the pictographs. Each design element (Table 1) was described according to a standard list of elements (Nissen n.d., Table 1); plotted according to its location on the panel (Figs. 2 and 3); and the colors were described using a Munsell Soil Color Chart (Table 2). The tracings were reduced to allow for their inclusion in this report (Figs. 4-18).

### PIGMENT SAMPLES

Nine pigment smears were taken using a non-destructive sampling technique (cf. Table 2 for a discussion). These samples will be retained for future archaeometric analysis (Mckee and Thomas 1973, Koski, McKee and Thomas 1973).

COMMENTS/DISCUSSION

The anthropomorphic, zoomorphic and curvilinear elements present at Painted Cave strongly suggest that the site was used, at least occasionally, as a locus of ritual activity related to hunting (cf. Heizer and Baumhoff 1962 for a discussion of the relationship of rock art in general to ritual hunting magic; cf. Thomas 1976, Nissen 1974 and von Werlhof 1965 among others). The location of the site, the presence of pigment stones/ochre along with a pigment processing tool in the deposit, and the chronologically late projectile points (ca. A.D. 600 - historic) suggest that (1) the pictographs are chronologically late in time; (2) one of the site functions was as a center for hunting activity; (3) the pictographs were made contemporaneously with the occupation and are not the product of post depositional occupation/ utilization of the site; and (4) the location of the site at the mouth of a canyon and perhaps alongside a former prehistoric game trail would appear to lend additional support to the hunting magic hypothesis originally advanced by Heizer and Baumhoff (1962) for Great Basin petroglyphs and pictographs.

Sites with extensive pictographs present in the western Great Basin (cf. Heizer and Baumhoff 1962) are not common. While single isolated and small groups of pictographs are known from Salt Cave (NV-Ch-55), Dynamite Cave (NV-Ch-49), Burnt Cave (NV-Ch-26), Fish Cave (NV-Ch-120), Leonard Rockshelter (NV-Pe-14) and NV-Pe-27 (among others) no one site has any designs present equivalent in scope to those present at Painted Cave. The presence of these pictographs alone determines the significance of this site.

NOTES

1. Original photographic materials and tracings are on file at the R.H. Lowie Museum of Anthropology, University of California, Berkeley.

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TABLE 1

PAINTED CAVE PICTOGRAPHS

| | | | |
|---|---|---|---|
| Panel 1 | # 1 | abstract human or insect | red |
| | # 2 | realistic human | red |
| | # 3 | realistic human, arm outstreached (touching # 4 and # 7) | white smeared with red |
| | # 4 | realistic human, arm outstreached | red |
| | # 5 | realistic human | red |
| | # 6 | human ?, armless, headless | red |
| | # 7 | abstract design | red |
| | # 8 | abstract human ?, with winged arms or insect | red |
| | # 9 | slightly wavy line | red |
| | # 10 | stick figure human | very faded red |
| Panel 2 | # 1 | amorphous design | red |
| | # 2 | amorphous design, not illustrated | red |
| | # 3 | realistic human holding object in hand | red |
| | # 4 | realistic human | red |
| | # 5 | abstract/amorphous design | red |
| | # 6 | abstract human, bulbous head and legs | red |
| | # 7 | stick figure human | white |
| | # 8 | realistic human, bulbous foot | red |
| | # 9 | amorphous red/orange smear with white human (with bulbous base in place of legs) superimposed | red/orange, white |
| Panel 3 | # 1 | realistic human, head dressed or masked ? | red |
| | # 2 | realistic human with phallus (yellow) with superimposed (red) splotches | yellow, red |
| | # 3 | pair of humans, dancing ? | faded red |
| | # 4 | abstract human with abstract design and circle | red |
| | # 5 | realistic human | red with white and charcoal smear |
| | # 6 | bisected circle with split end | red |

TABLE 1

| | | |
|---|---|---|
| # 7 | mountain sheep, boat shaped body, horns to rear | red |
| # 8 | quadruped | red |
| # 9 | curvilinear meander | red |
| # 10 | quadruped | red |
| # 11 | realistic human with out head and arm | white |
| # 12 | realistic human with phallus | red with some white and charcoal smear |
| # 13 | animal ? | red |
| # 14 | striated hand, abstract circle | red |
| # 15 | unclosed circle and dot | orange dot and orange line, red semi-circle |
| # 16 | realistic human with phallus | red |
| # 17 | realistic human | faded red |
| # 18 | circle and dot | orange dot, red circle |
| # 19 | pair of abstract humans, vandals attempted to chisel out designs | red |
| # 20 | abstract human with phallus | red |
| # 21 | abstract human, circle and dot | red human, faded red circle, faded orange dot |
| # 22 | circle with dot | red |
| # 23 | quadruped | red |
| # 24 | striated hand (best example) | red |
| # 25 | abstract human | faded red |

Hands: Seven other hands, most striated or outline form, all less complete than Panel 3 # 24, are all located in Panel 3 and most are near # 24. All are red.

TABLE 2

PAINTED CAVE PICTOGRAPHS

CONCORDANCE OF SAMPLED PIGMENTS, MUNSELL COLOR

Pigment samples were obtained by moistening a clean sable paint brush with distilled water and wetting a small area of pictograph design. The water picks up a small amount of pigment from the design in a non-destructive fashion and this wet pigment is then transfered onto clean clear glass microscope slides and allowed to dry.

| | | | |
|---|---|---|---|
| Slide # 1 | Red pigment | Panel 1 | |
| # 2 | Red pigment | Panel 3 | |
| # 3 | Red pigment | Panel 3 | |
| # 4 | Faded red | Panel 3 # 3 | |
| # 5 | Red pigment | Panel 3 | |
| # 6 | Orange | Panel 3 | (polychrome circle and dot) |
| # 7 | Orange | Panel 3 | |
| # 8 | White | Panel 2 | |
| # 9 | White with charcoal together superimposed on red | Panel 2 | |

Munsell Soil Color Determinations: (dry, against shelter wall, shade)

| | | | | |
|---|---|---|---|---|
| Red pigment, Panel 1 | 7.5 | R | 5/6 | 'red' |
| White pigment, Panel 2 | 5 | YR | 8/1 | 'white' |
| Orange-yellow pigment, Panel 3, circle and dot | 10 | YR | 7/8 | 'yellow' |

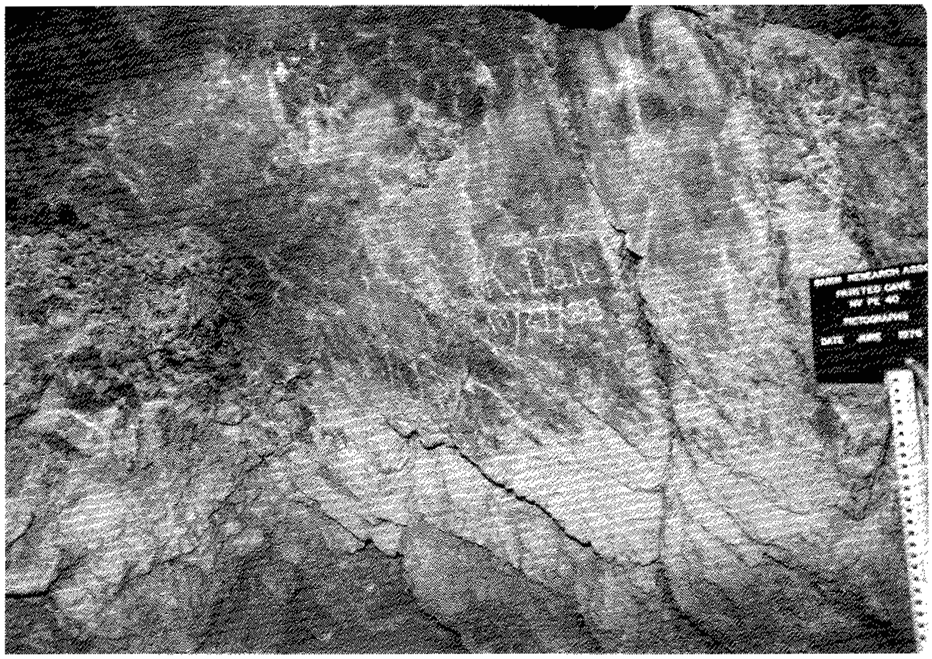


Figure 1: Pictographs on rear wall of Painted Cave (#10.9).

PAINTED CAVE PICTOGRAPHS

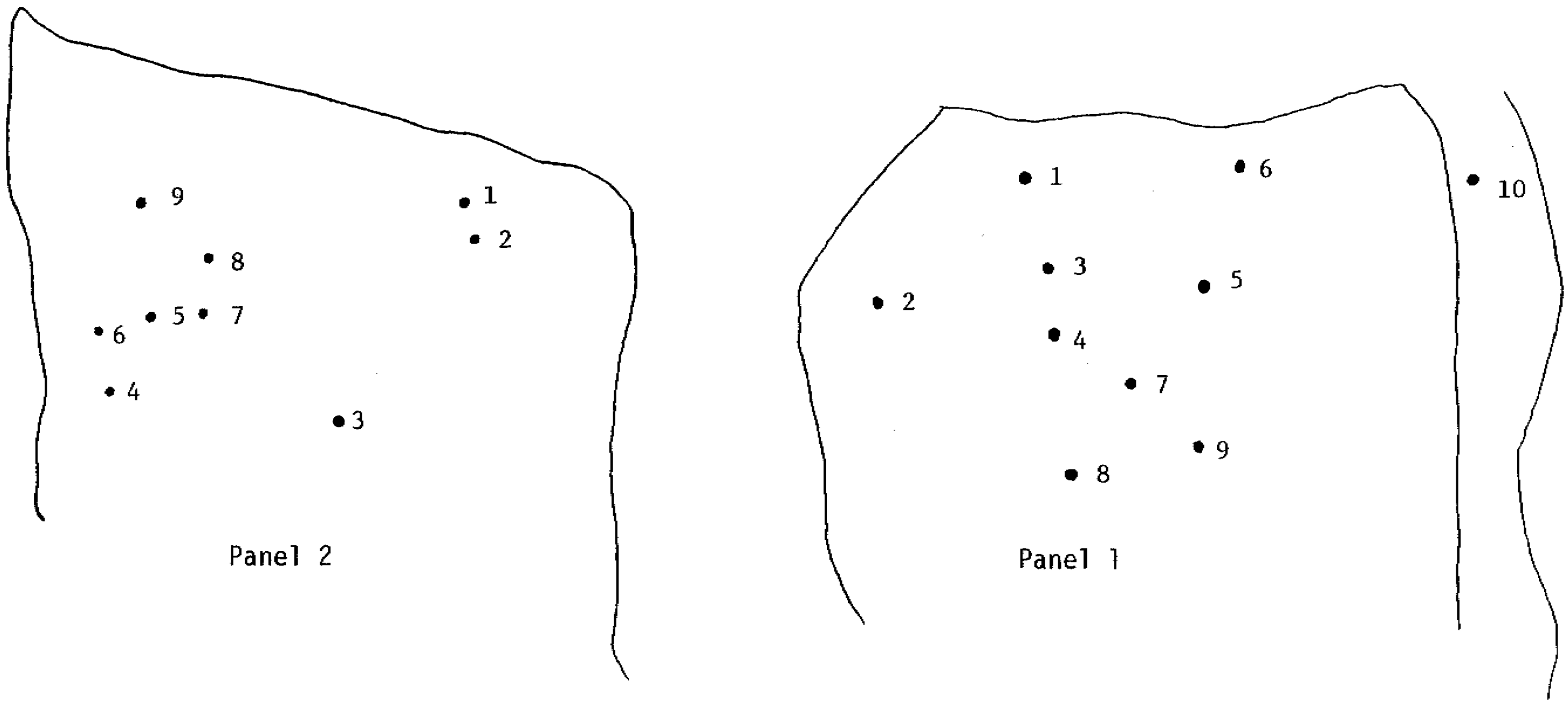



Figure 2: Design Element Location Key.

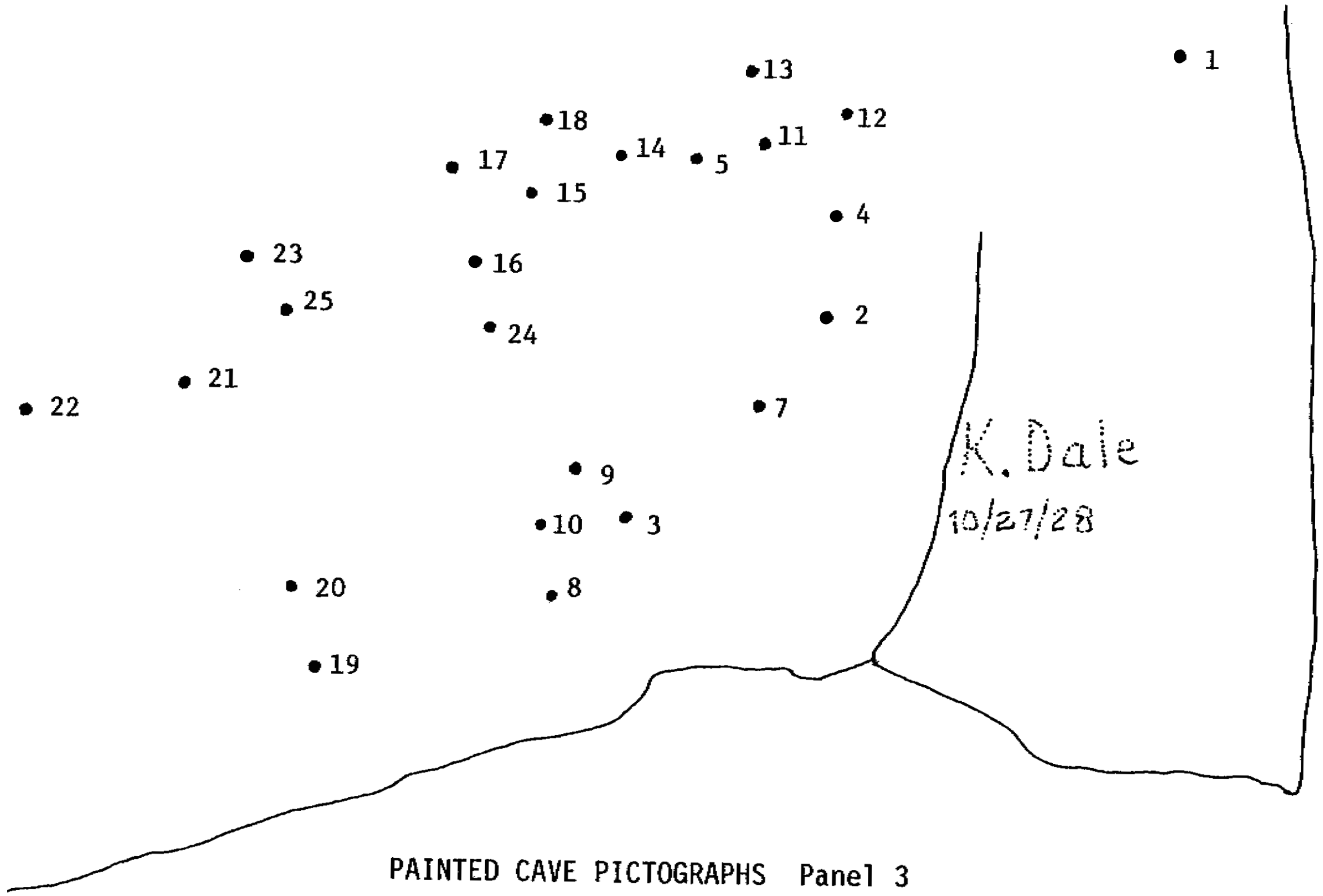
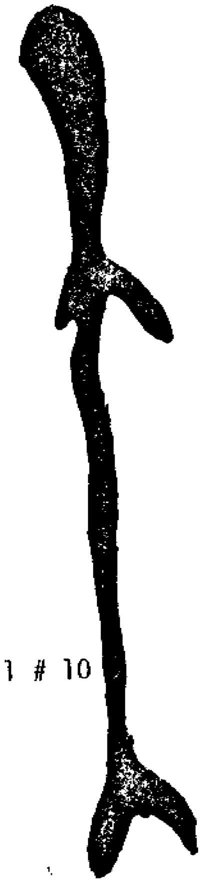



Figure 3: Design Element Location Key.

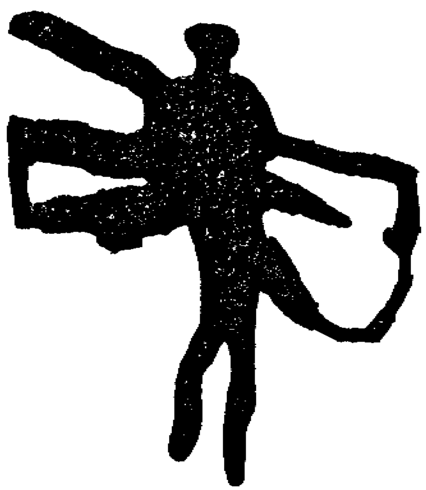
Panel 1 # 1

Panel 1 # 2

Panel 1 # 3 & 4



Panel 1 # 10



Panel 1 # 8

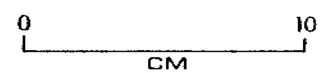



Figure 4

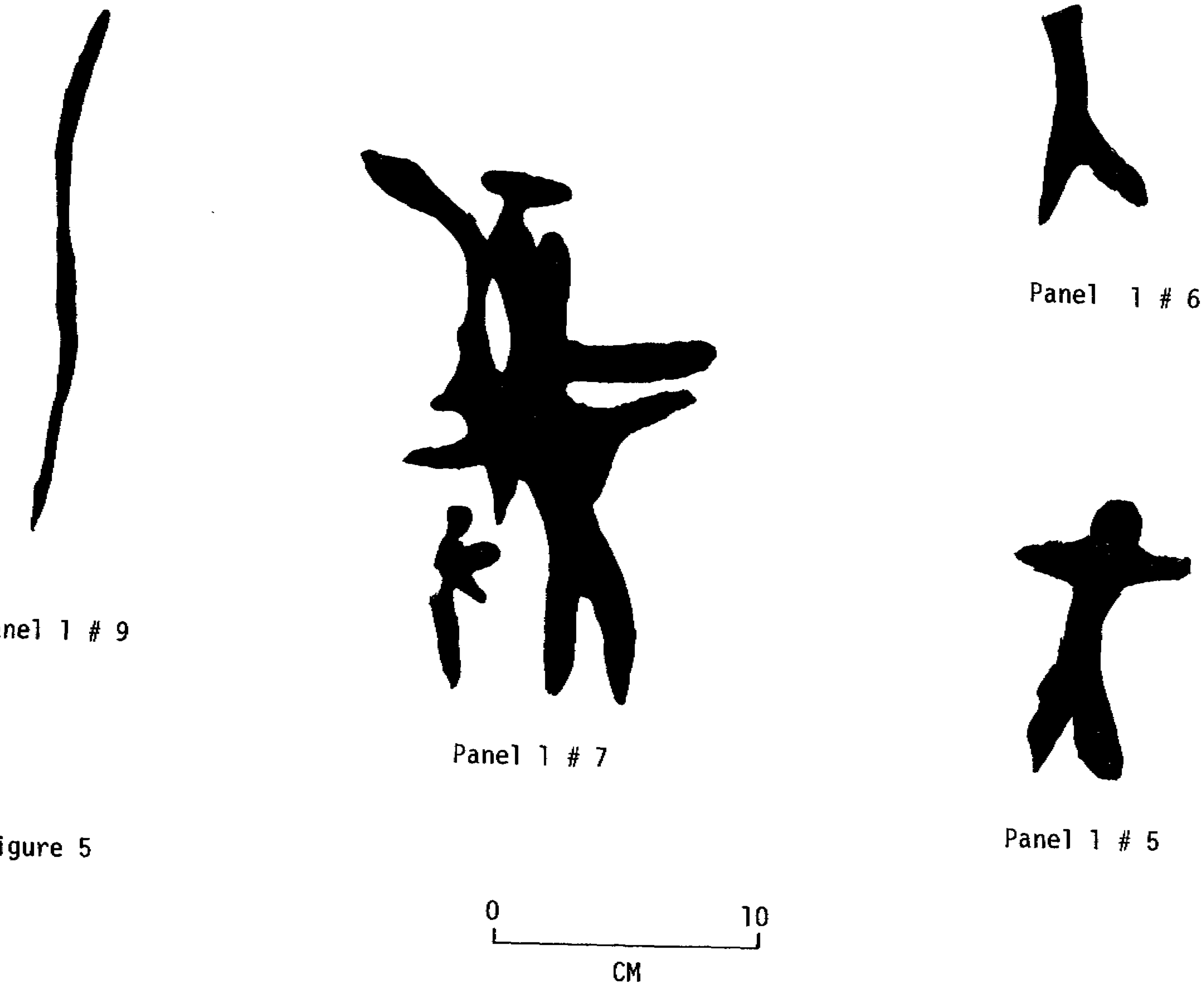
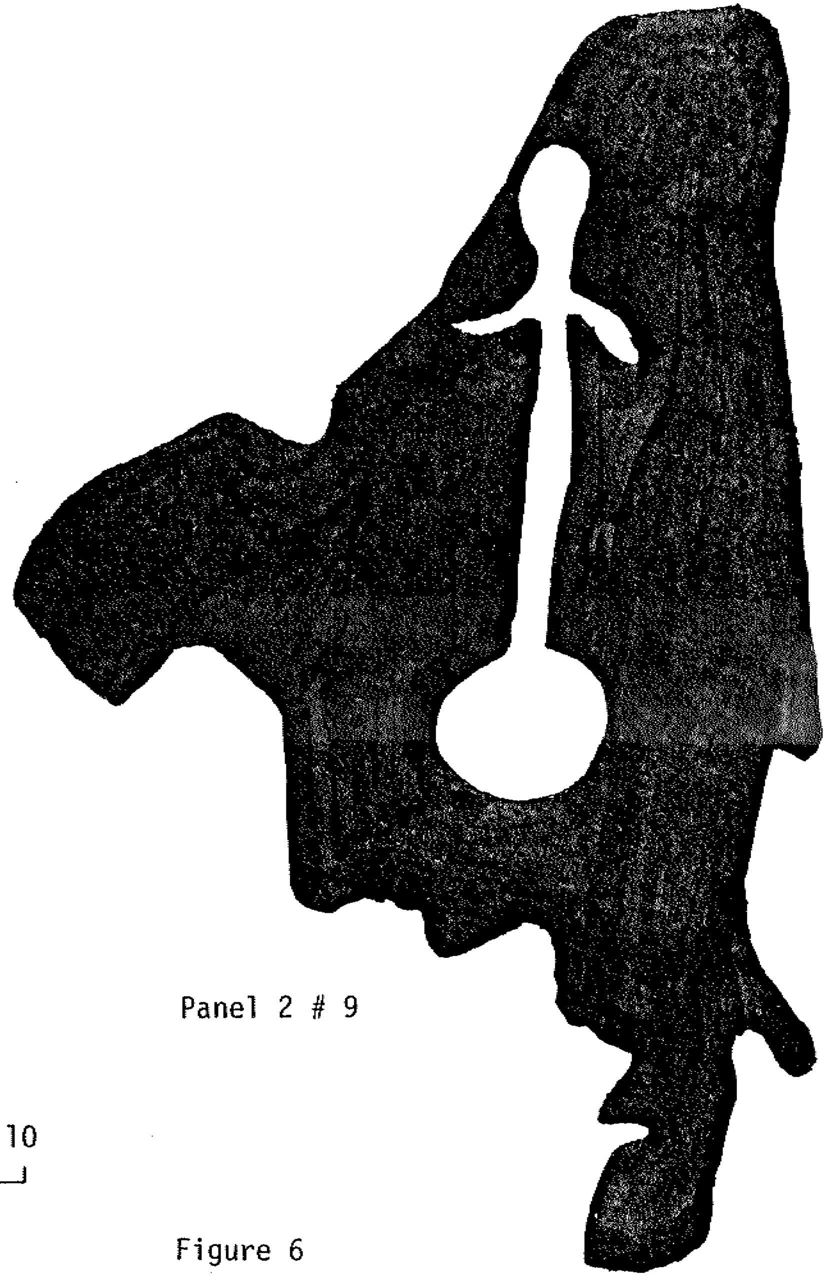



Figure 5

Panel 2 # 1



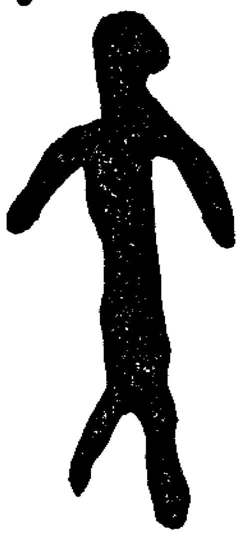
Panel 2 # 9

0 10

CM

Figure 6

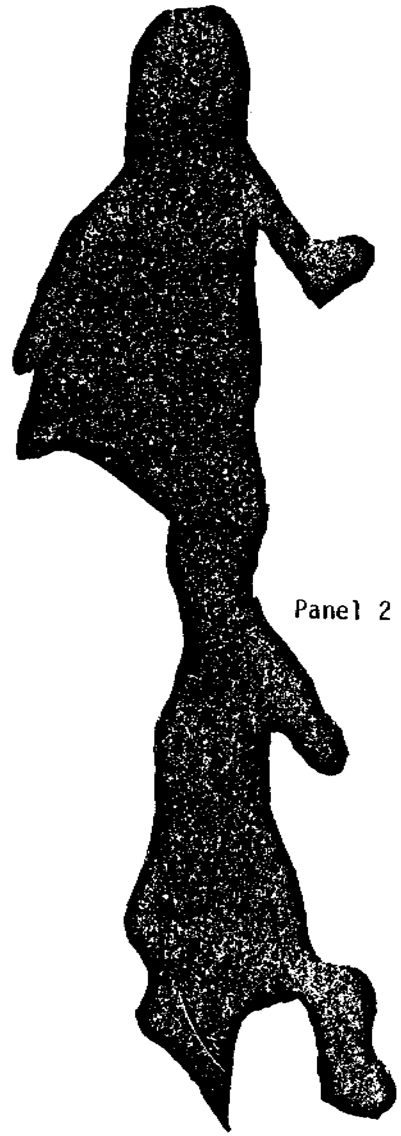
Panel 2 # 3



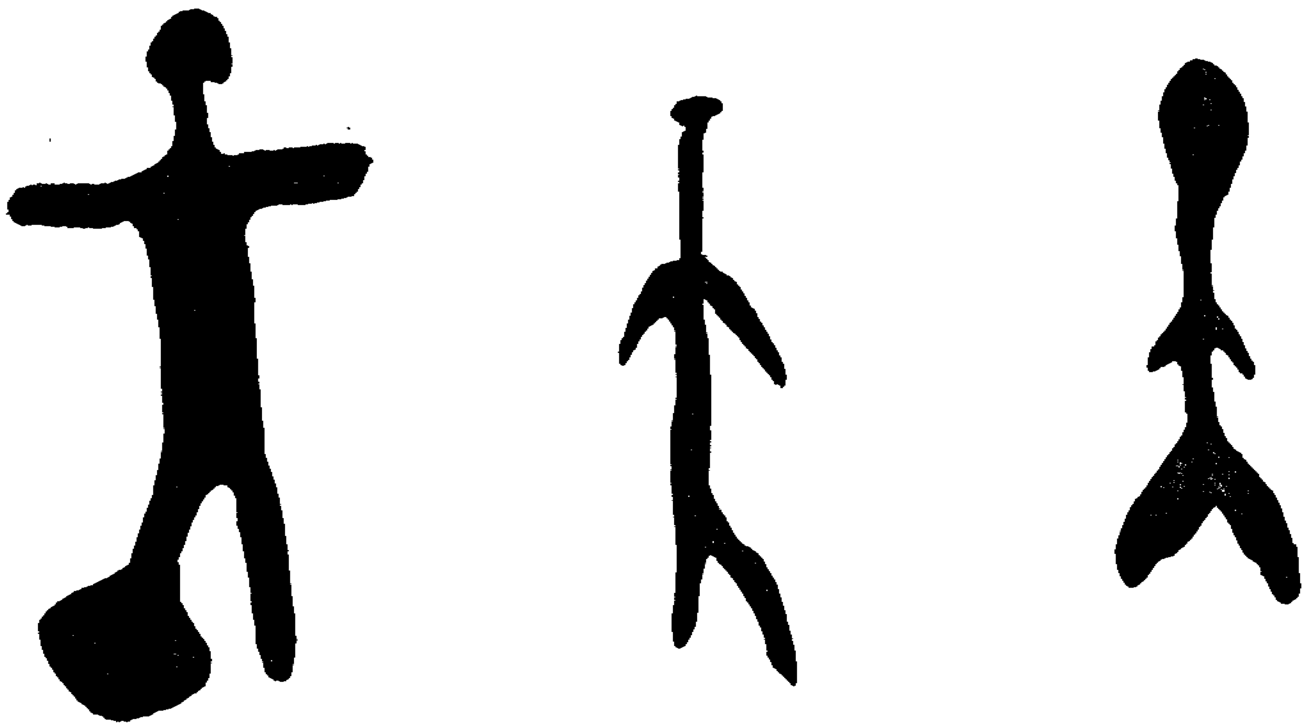
Panel 2 # 4

Figure 7

0 10
CM



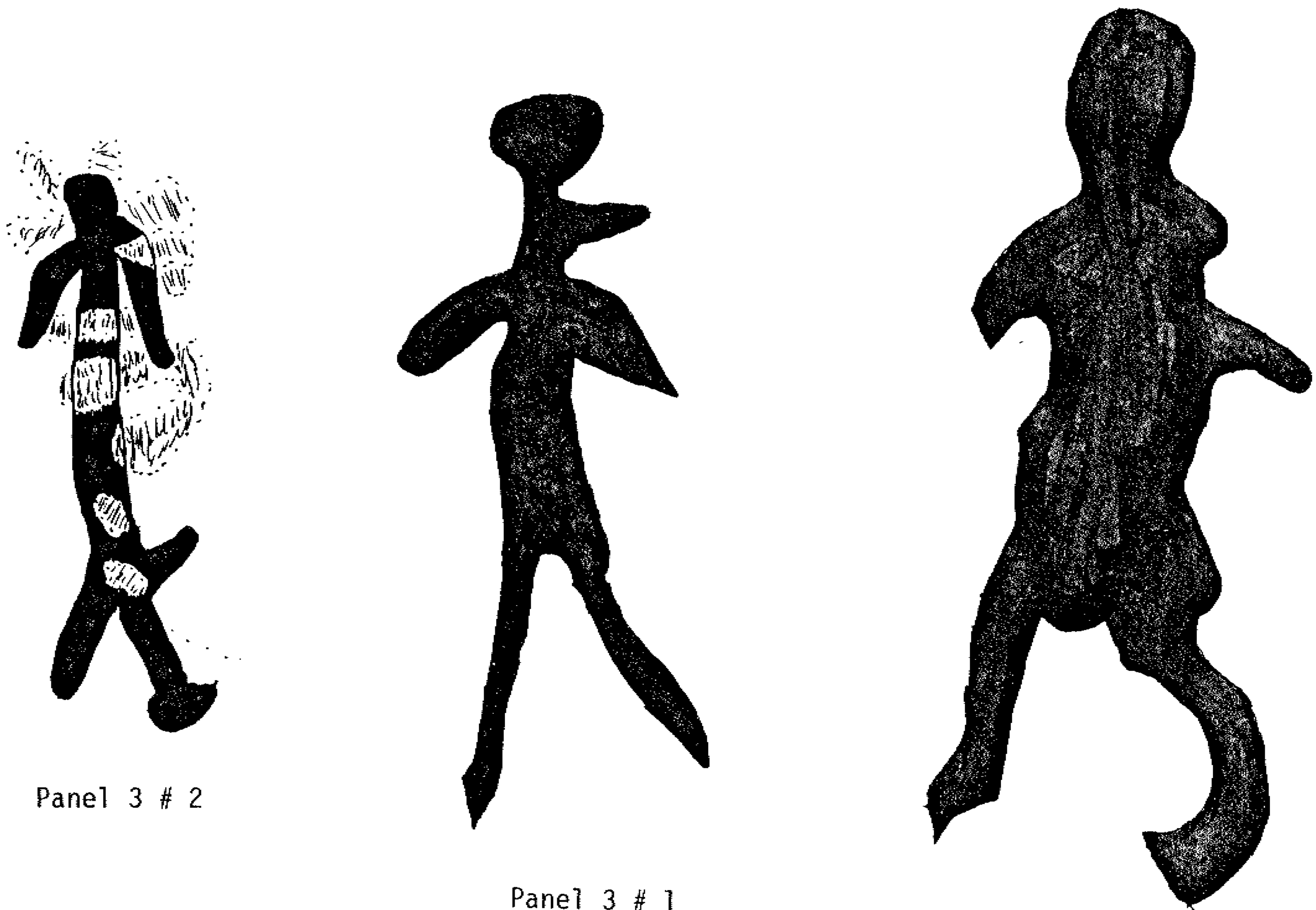
Panel 2 # 5



Panel 2 # 8 Panel 2 # 7 Panel 2 # 6

0 10
CM

Figure 8



Panel 3 # 2

Panel 3 # 1

Panel 3 # 25

0 10

CM

Figure 9

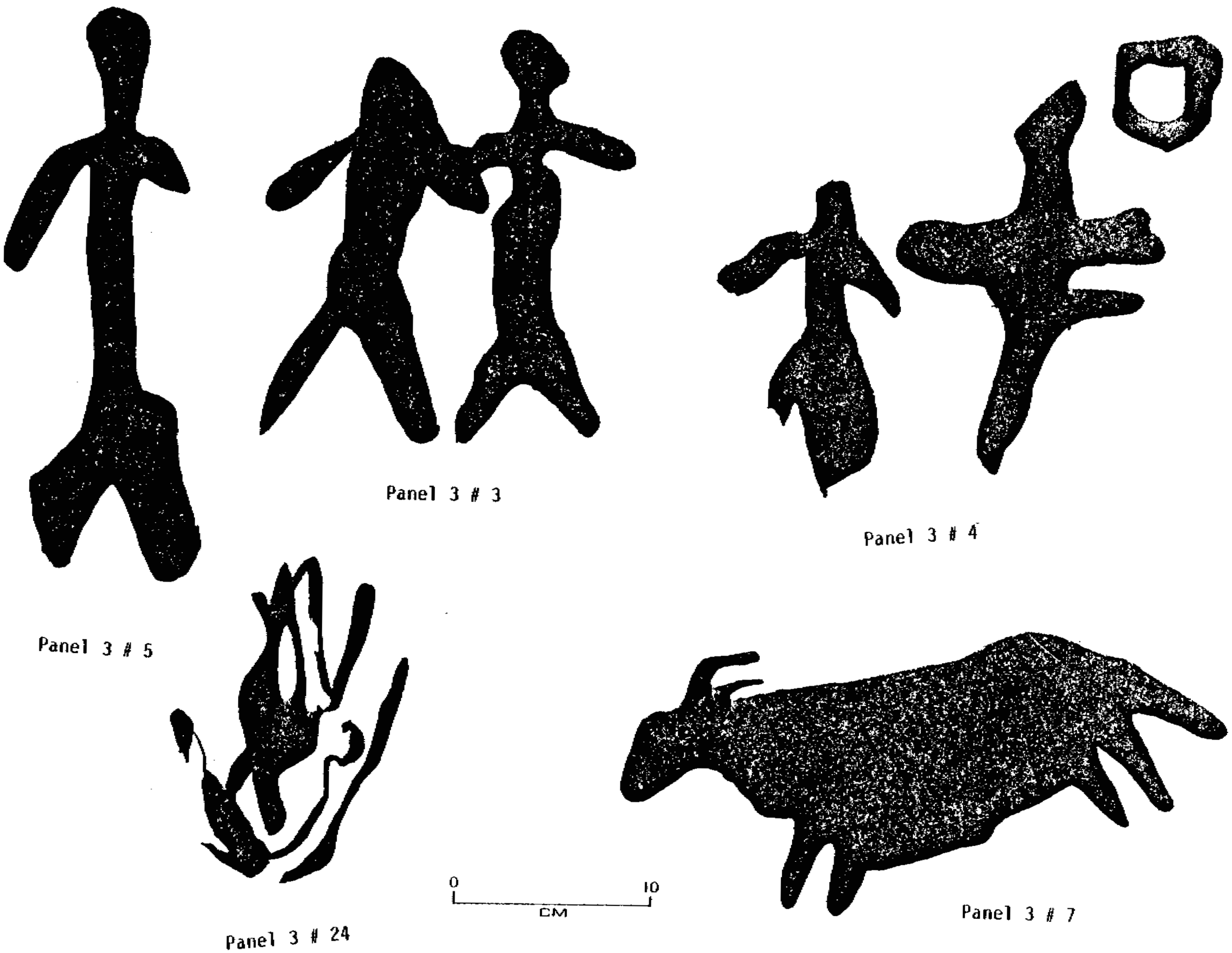



Figure 10

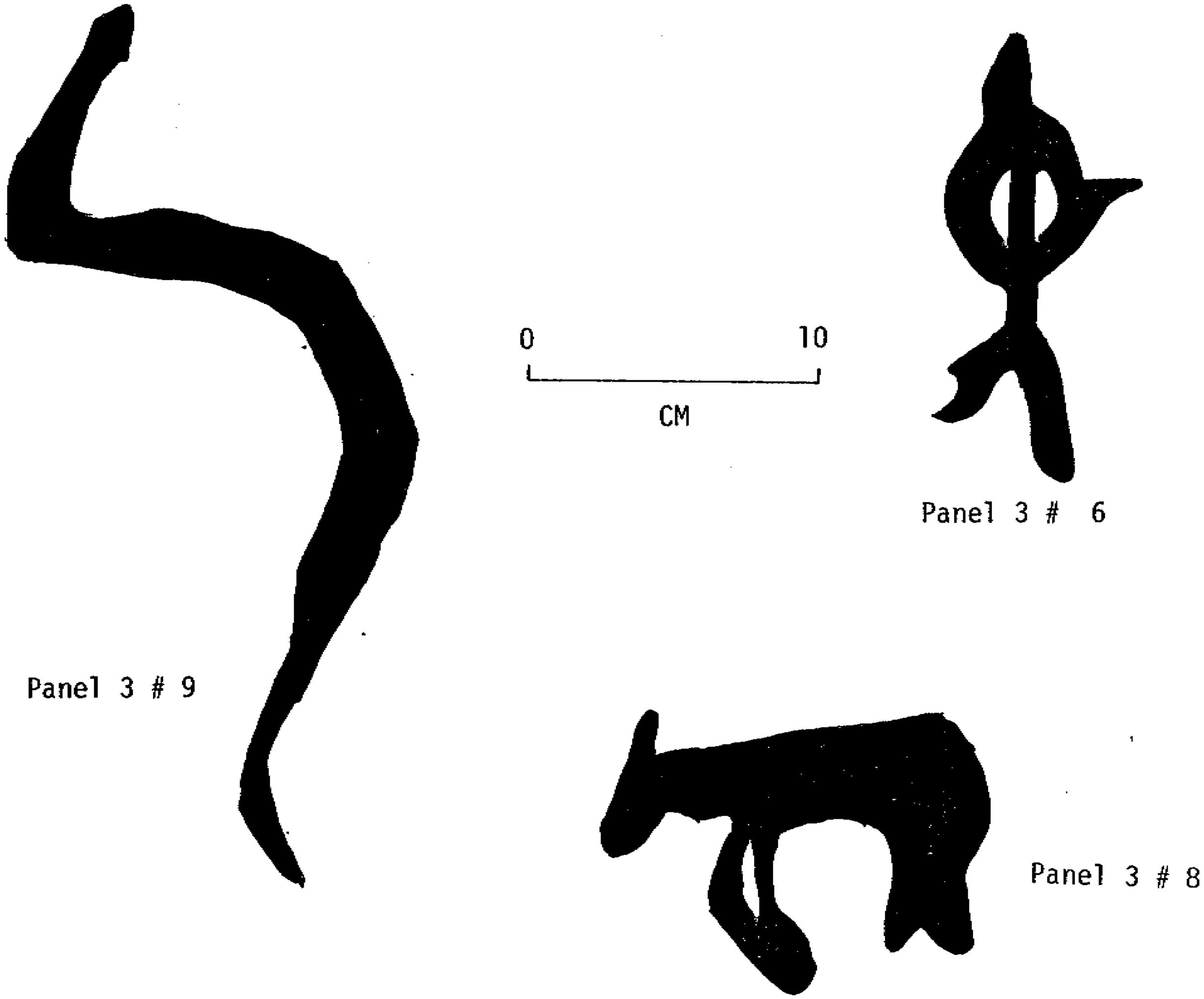
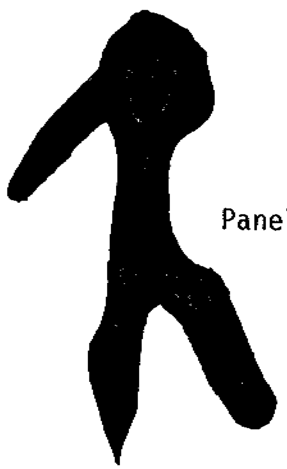



Figure 11

Panel 3 # 12

Panel 3 # 10



Panel 3 # 11

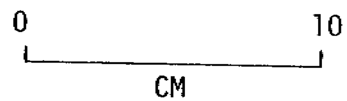
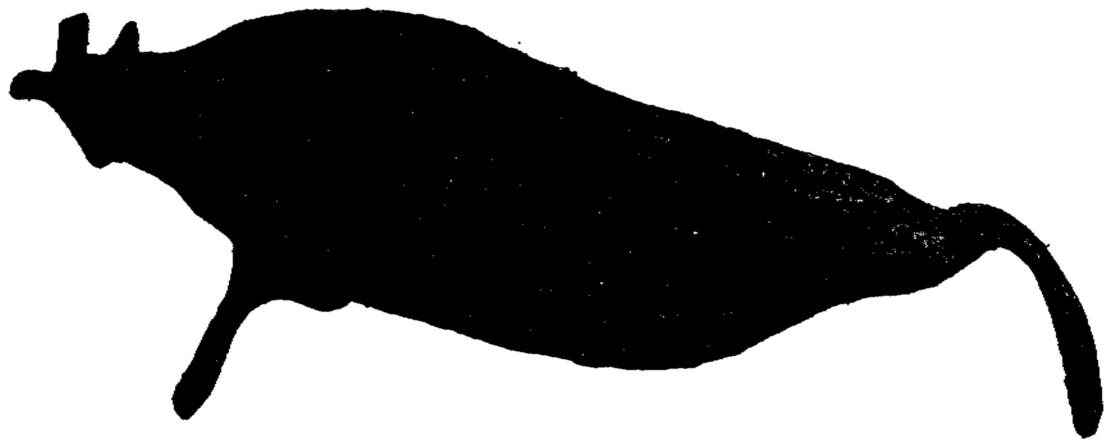



Figure 12

Panel 3 # 14



Panel 3 # 13

0 10

CM

Figure 13

Panel 3 # 16

Panel 3 # 15

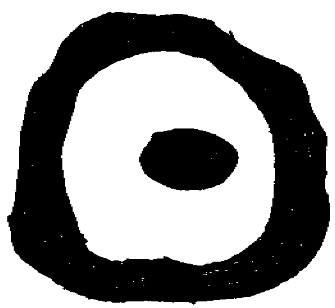
0 10

CM

Figure 14

Panel 3 # 19

Panel 3 # 17



Panel 3 # 18

0 10

CM

Figure 15

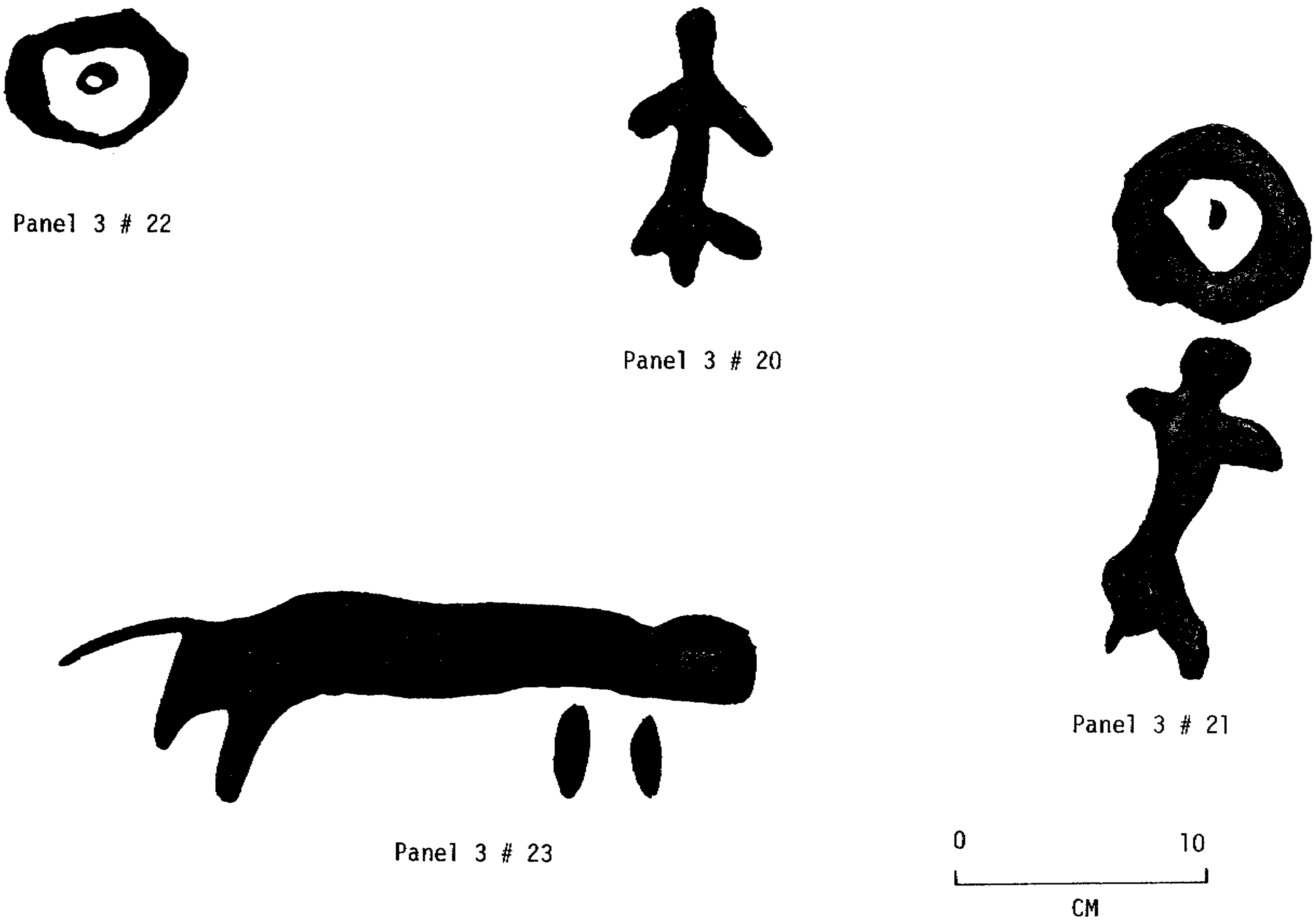



Figure 16

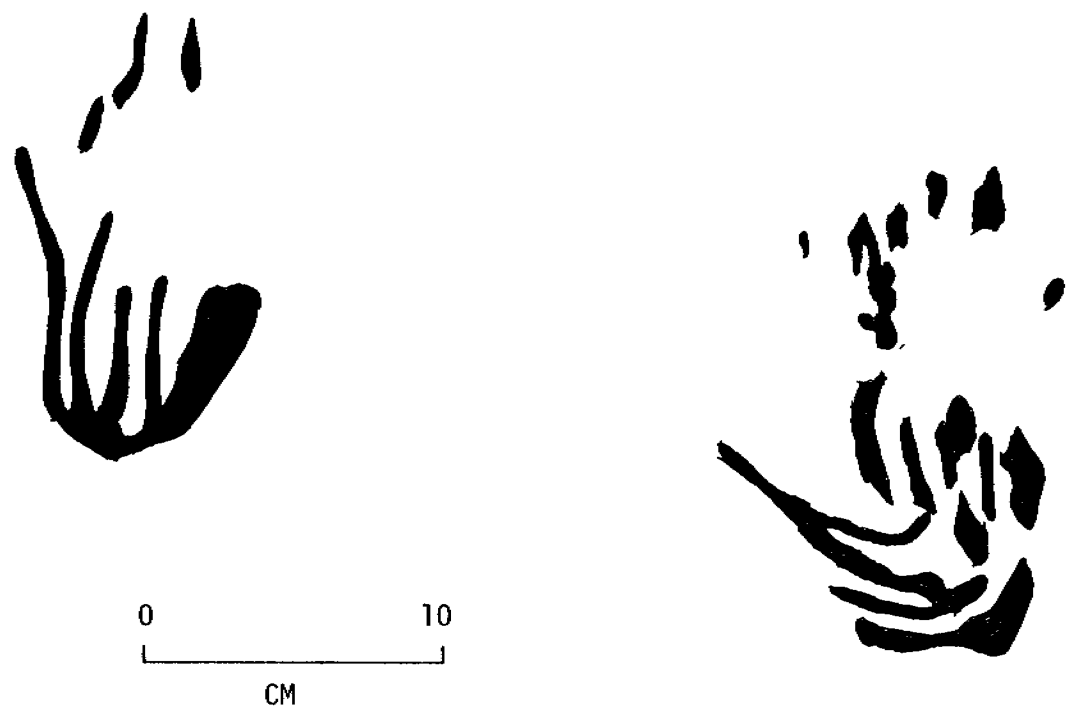



Figure 17

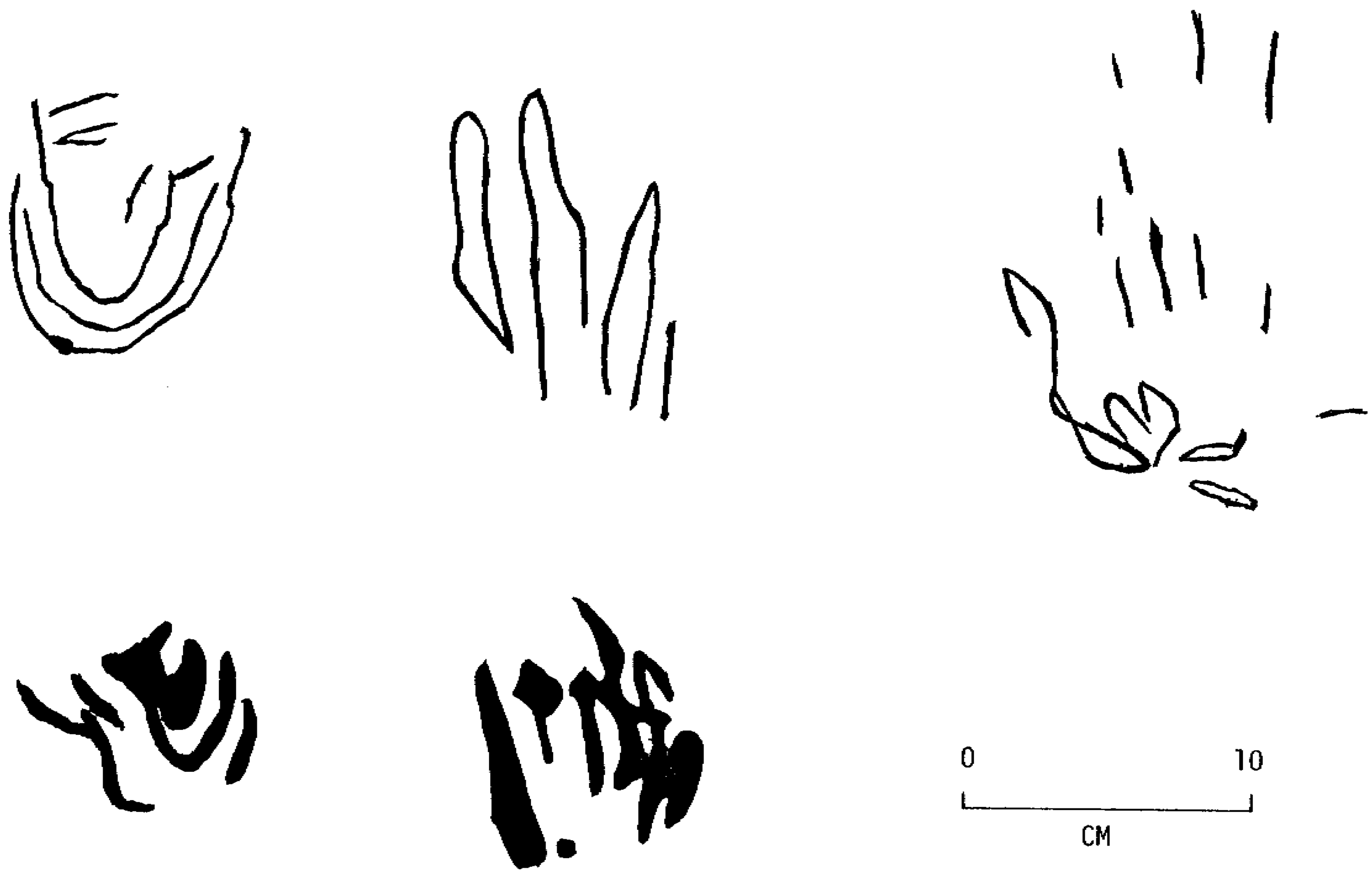



Figure 18

APPENDIX IV

Management Objectives and Recommendations

The following policy/planning recommendations are made specifically in response to the contract conditions mandated by the Bureau of Land Management.

ASSESSMENT OF DAMAGE POTENTIAL - NATURAL PROCESSES

The potential for damage/destruction of the site through natural processes come from two sources. These are detailed below and recommendations have been made to alleviate their impact.

Of foremost concern is the potential for disturbing the integrity of the cultural deposit through flooding by Spring Creek and the associated erosion processes. Our on-site inspection indicated that at present, Spring Creek rarely reaches flood stage (i.e. innundates the site and canyon or has a sufficient flow of water to cause any damage to the site. This may be due largely to a diversion dam/holding pond constructed upstream by local ranchers that retards or eliminate the flow of water through Spring Creek Canyon. However, judging from the steep 'arroyo-like' banks directly in front of the site, it is possible that significant releases of water do occur periodically although with what frequency we do not know.[1] Our recommendations for mitigative action are detailed below:

1). A study should be made by competent hydrologist to determine the average and maximum stream flow through Spring Creek Canyon;

2). Release of any significant water from the dam/holding pond must be kept to no more than a 1.5 m rise as measured in front of Painted Cave from stream bottom up;

3). If necessary, the release of any appreciable amount of water must be strictly controlled and monitored/supervised by competent and responsible personnel. Advance notice of any release should be given to allow for archaeological inspection during the release;

4). If feasible, water release into Spring Creek Canyon should be prohibited to insure protection of the site; and

5). If (4) is not possible, a sand bag retaining wall should be constructed around the site to provide against local flooding. This wall should be maintained and inspected regularly.

The other main area of concern is with the deterioration of the rock-shelter formation and the pictographs present inside the shelter by weathering. Mechanical weathering has created several small rockfalls within the shelter proper as well as several areas of loose parent material. Stabilization with small amounts of mortar, cement or concrete would correct this situation. Suitable care must be taken if this course of action is followed so as not to interfere with the aesthetic or visual value of the site.

The effects of sunlight, aeolian dust, general weathering and other natural effects may be harmful to the pictographs in the shelter. Fading of several of the design elements is present. Retarding the destruction and preserving this pictographic art has no easy solution. Experimentation with various plastic coatings on petroglyphs and pictographs has offered some promising results (Burke, personal communication, 1978) but at present no definitive course of action can be proposed. If preservation techniques are ever available in the future, it is recommended that they be utilized to preserve the pictographs as a cultural resource for future generations.

1. D. Burke (personal communication, 1978) indicates from his personal inspection of the area that Spring Creek has been steadily downcutting due to the faults present in the area. This downcutting of the stream channel may be sufficient to accomodate any water release that may occur through Spring Creek without flooding the site.

## ASSESSMENT OF DAMAGE POTENTIAL - CULTURAL PROCESSES

Damage or destruction to Painted Cave could occur (and has already occurred) through vandalism and use of the shelter by cattle seeking shelter. We suggest that the narrow entrance to Spring Creek Canyon be fenced with a gate and lock to prevent entry by unauthorized personnel and animals. This active rather than passive program of protection <u>may</u> help preserve or at the least, minimize damage to the site until an educated and concerned public allows for self policing of their cultural resources. Cattle grazing should also be banned in the canyon to avoid further bovine impacts on the site.

## PROBLEM ORIENTED RESEARCH

Problem oriented research or a large scale or regional nature can not be addressed from the excavations at Painted Cave. The excavations conducted at the site were site-specific in terms of research approach. Therefore, problem oriented research can only be offered on a site specific basis. That is to say, extracting the maximum information possible from the site and integrating it into the known cultural record for the area. To this end, we suggest several paths of inquiry that should be considered if future excavation and analysis are considered.

### Proposed Areas of Research Interest

1). Lithic Analysis - Discussion of manufacturing techniques, processes being employed at the site (e.g. workshop, maintenance, etc.)

2). Living/Occupation Floor - Determination of extent of floor, and does it conform to ethnographic material on record for the Great Basin. Are spacially distinct activity areas present?

3). Faunal Analysis - Subsistence, ecological information, and seasonality can be further investigated. How does the information relate to the ethnographic record?

4). Seed Analysis - Subsistence, ecological information and seasonality to be considered and how does information obtained correlate with that which is known ethnographically?

5). The Utility of 1/4" versus 1/8" screening recovery methods.

6). Flotation - Whole samples for seed recovery, small mammals, fish bone, etc. What does this recover and add to the overall data base available for the site?

7). Soil Analysis - Pedological examination, depositional history of the site, presence of phytoliths for environmental information.

8). Radiocarbon Dating - Chronological information on projectile points, site use.

9). Pictograph Pigment Analysis - Types of pigments used; technological processes of pigment formulation and application.

10). Placement of the Site in Regional Settlement Pattern.

11). Hunting-Magic - Reconnaissance of surrounding areas for confirmatory evidence (e.g. hunting blinds, rock alignments, other rock art).

12). X-ray Fluorescence - Raw material source location, trade/procurement networks, etc. from obsidian analysis.

These are only several of the items of interest that should be considered and incorporated into any future research design proposed for the site.

## COST ESTIMATES FOR FURTHER RESEARCH

Based on the preliminary test excavations the following research proposal is offered in the event that future work is funded at a level to allow for professional and scholarly excavation and reporting.

We propose additional excavation in the vicinity of the excavated units (cf. this report) and of selected units outside of the dripline but near the present excavations to allow for an areal exposure of the main occupation area of the site. These excavations would 1). recover additional cultural materials to allow for confirmation of the present chronological information available for the site; 2). confirm the activities (plant procurement, lithic manufacture, etc.) present; 3). expose the rest of the living/occupation floor and perhaps reveal spacially distinct activity areas; and 4). allow for the accumulation and interpretation of a much larger body of data than that currently known for the site. Due to the nature of the present vandalism it is imperative that a research salvage program be considered as appropriate mitigation for the site.

The research proposed above would involve the excavation of no more than seven $2m^2$ units ($28\ m^2$) and the analysis of the recovered artifacts. Based on our previous research at the site, we estimate a total of 130 man days in the field and 150-200 man days laboratory time depending on the amount of analysis required. Personnel costs would be in the neighborhood of $1000 per $m^3$ exclusive of indirect, support and other costs.[1] We estimate that a project of the magnitude specified above would be in the range of $50,000.

Any level of mitigation or future BLM funded research at the site should have a research design agreed upon by BLM cultural resource management specialists and research archaeologists to determine the best possible level of research that can be conducted with any available limited funds.

1. Estimates by the National Park Service cultural resource management specialists currently suggest about $1000 for personnel costs per $m^3$ of cultural fill. This of course can vary with each site.

# APPENDIX V

## Nevada State Museum Collection

### INTRODUCTION

In 1971, Mr. Donald R. Tuohy (Nevada State Museum) and Dr. Peter J. Mehringer (Washington State University) visited Painted Cave and made a small surface collection of artifacts previously disturbed from their primary context by vandals. Five chipped stone artifacts were collected and are now located in the Nevada State Museum. We wish to thank Mr. Tuohy who has kindly loaned the following specimens for analysis.

### CHIPPED STONE ARTIFACTS

Biface Fragment (Figure Ia)

PROVENIENCE: Recovered from pothunter disturbed deposit

DESCRIPTION: This specimen is a small ovate shaped biface fragment. The distal portion of the specimen is snapped off while the medial and proximal regions are intact. The specimen is made on an interior flake and has a plano-convex cross section.

MATERIAL: Chert

MEASUREMENTS: Length, 2.97 cm; Width 2.59 cm; Thickness, 0.7 cm.

Graver (Figure Ib)

PROVENIENCE: Recovered from pothunter disturbed deposit

DESCRIPTION: This specimen is made on a small lateral fragment of a biface. The distal end has been retouched into a graver (burin) tip. The specimen is made from an interior flake and has a biconvex cross section.

MATERIAL: Chert

MEASUREMENTS: Length, 3.68 cm; Width, 1.09 cm; Thickness, 0.5 cm.

Flake Fragments (Figure Ic,d)

PROVENIENCE: Recovered from pothunter disturbed deposit

DESCRIPTION: Both specimens are fragments of interior flakes.

MATERIAL: Obsidian - 2

MEASUREMENTS: First specimen: Length, 2.15 cm; Width, 1.55 cm; Thickness, 0.5cm. Second specimen: Length, 2.28 cm; Width, 1.25 cm; Thickness, 0.5 cm.

Rose Spring Corner Notch Projectile Point (Figure Ie)

PROVENIENCE: Recovered from pothunter disturbed deposit

DESCRIPTION: This specimen is a complete projectile point with convex blade edges, a slightly convex base and is squat triangular in outline, and bi-convex in cross section.

MATERIAL: Chert

MEASUREMENTS: Length, 2.48 cm; Width, 1.70 cm; Thickness, 0.35 cm.

## DISCUSSION

The materials recovered by the Nevada State Museum team are consistent with the assemblage recovered by Basin Research Associates and the specimens are illustrated in Figure 1. The recovery of a Rose Spring series projectile point is significant. Except for the recovery of an Eastgate Expanding Stem, all projectile points from Painted Cave were either Desert Side Notch or Cottonwood Triangular series. The Rose Spring point suggests more strongly that the site was occupied in Rose Spring/Eastgate times and that our earlier estimate for the temporal span of occupation may need revision further back into time. We stated that Painted Cave was a late Medithermal age site, occupied from ca. A.D. 1400 to the late prehistoric/historic period. Layton (1970) reports obsidian hydration measurements which suggest that the Rose Spring series may have been in use as early as 300 B.C. in the western Great Basin. In any case the presence of both Eastgate and Rose Spring points from Painted Cave confirms an earlier occupation than that which would be suggested by the preponderance of Desert Side Notch and Cottonwood points.

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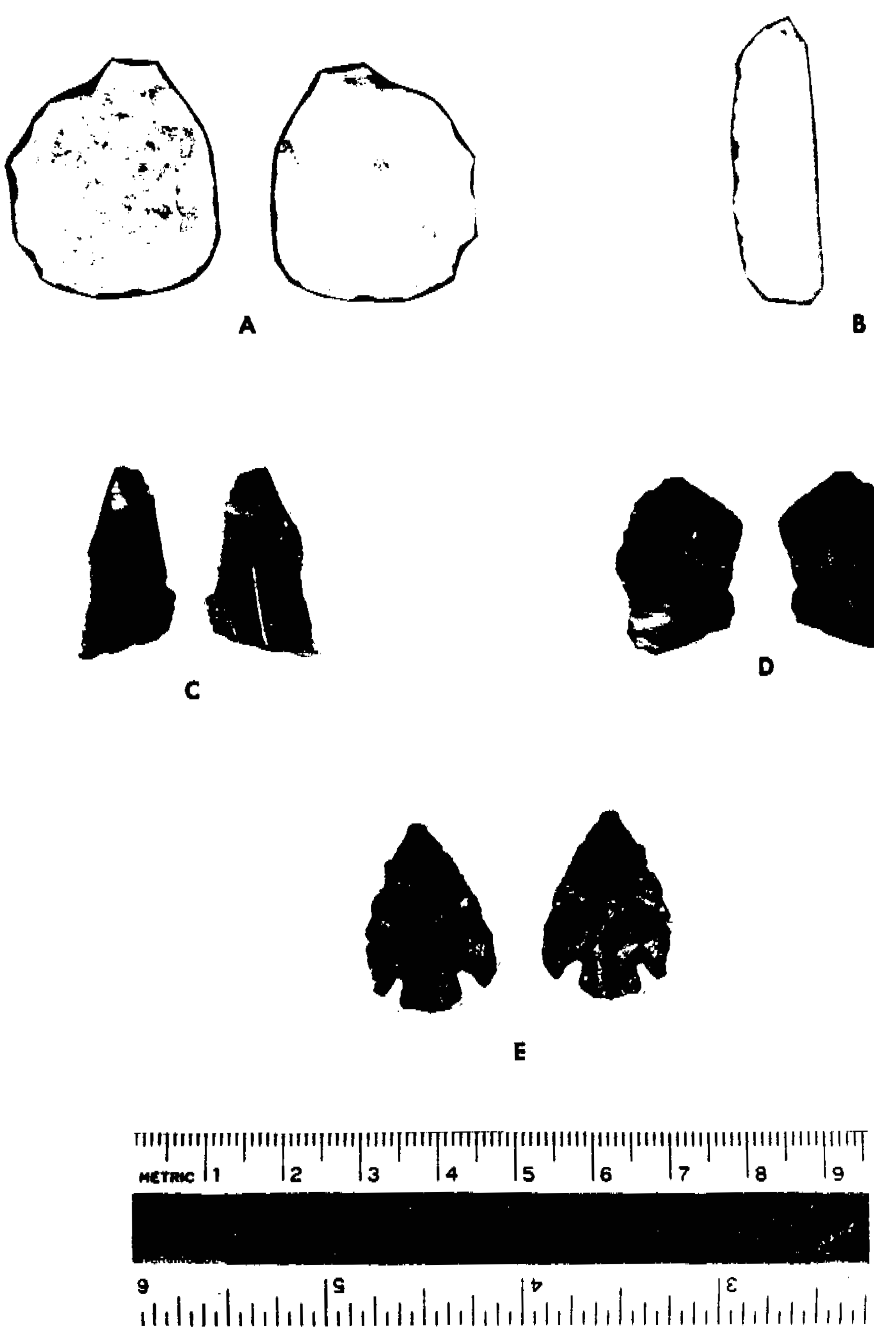
FIGURE I



# APPENDIX VI

## Geology of Painted Cave

By

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United States Geological Survey
345 Middlefield Road
Menlo Park, California 94025

Painted Cave is in the gorge of Spring Creek in a bedrock ridge at the south end of the Tobin Range between Pleasant and Dixie Valleys. Crustal-warping and episodic offsets along "Basin and Range" normal faults make mountain blocks and valley basins of the region. Nearby faulting and earthquakes occurred in 1903, 1915 and 1954. The ridge was uplifted slightly in 1915 and scarps produced during that earthquake pass within several kilometers of the site. Perennial springs in Pleasant Valley that feed Spring Creek rise along fault zones and fluctuate with fault activity.

Johnson (1977) describes the geology of the region. Mountain blocks consist of diverse, much deformed sedimentary and volcanic strata of Paleozoic and Mesozoic age, intrusive bodies of Mesozoic igneous rock, and Cenozoic volcanic flows and ash beds. Valleys fill with fans of alluvium from erosion of rising mountains, and closed valley basins contain deposits of Pleistocene lakes that stood high as recently as 12,000 years ago.

Geology of Painted Cave is mapped by Burke (1977) as recent alluvium within gorge walls of folded limestone beds of the Triassic (early Mesozoic) Natchez Pass Formation. Alluvium that fills the gorge to the foot of the shelter includes coarse flash-flood deposits, finer ponded deposits from waning floods and perennial stream flow, talus from gorge walls, windblown silt and sand, and human refuse. Strata are disturbed by tree and shrub roots, animal burrows and wallows, and trails and excavations of man.

The overhang of Painted Cave in the lower gorge wall is formed by collapse of several folded beds of undercut limestone. It does not appear to be much filled with sediment or to extend to any deeper caverns in bedrock.

Pleasant Valley, upstream from the site, contains a flat central floodplain that is entrenched between older fans of alluvium from the Tobin and East Ranges. The floodplain strata and deposits in the gorge are presently being gullied and downcut, in part because of lowering of the shoreline of the Pleistocene lake in Dixie Valley that is the sink of Spring Creek, in part because of drying climate and more seasonal rainfall conditions since Pleistocene time, and in part because of continued local crustal uplift centered on the gorge site. Perennial stream flow from Pleasant Valley springs is seasonally diverted for irrigation on the flood plain; erosion of the gorge occurs largely during summer thundershowers that produce occasional severe debris-laden flash floods. Climatic data from a U.S. weather station that is maintained at the Paris Ranch in Pleasant Valley is regularly published by the Department of Commerce.

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## APPENDIX VII

### Radiocarbon Dates

### INTRODUCTION

Three charcoal samples were submitted to the University of California, Los Angeles, Radiocarbon Laboratory of the Institute of Geophysics and Planetary Physics. The radiocarbon age determinations were provided by Dr. C. R. Berger under contract to the Bureau of Land Management, Winnemucca District Office.

### RADIOCARBON DATES

The following radiocarbon dates were obtained. The samples and their respective proveniences are described in detail on pages 31-32 of this report and will not be repeated here.

| UCLA Sample # | Catalogue # | Radiocarbon Age |
|---|---|---|
| UCLA-2176A | 2-61877 | 485 ± 60 years |
| UCLA-2176B | 2-61937 | <300 years |
| UCLA-2176C | 2-61946 | <300 years |

The dates were corrected according to the procedures outlined by Ralph, Michael and Han (1973) with the following corrections noted.

| | | |
|---|---|---|
| UCLA-2176A | 2-61877 | A.D. 1410 |
| UCLA-2176B | 2-61937 | A.D. 1510 - A.D. 1600 |
| UCLA-2176C | 2-61946 | A.D. 1510 - A.D. 1600 |

### DISCUSSION

The two dates from the samples (UCLA-2176B,C) recovered in unit S6E4 correspond with each other and offer contributing support along with the temporally diagnostic projectile points of a late occupation of the site. Based on these dates, the site can be assigned to the Yankee Blade Phase (cf. Thomas and Bettinger 1976) for the Reese River Valley to the east.

The data obtained from the hearth in unit S6E6 (UCLA-2176A) appear somewhat aberrant. The sample in question is stratigraphically superior to the other samples but yielded a date somewhat 'older' than the others. However, its corrected age and standard deviation ranges do make a reasonable case for accepting its validity in relation to the other two dates where no deviations were given. Therefore this date is accepted as valid.

In summary the radiocarbon age determinations support a late occupation(s) of the site between A.D. 1400 - A.D. 1600 (?). The abundance of mineral ochre nodules throughout the deposit coupled with the radiocarbon dates would apparently also indicate a late date for the numerous pictographs present on the rear wall of the shelter (cf. Appendix III and VIII). If this conclusion is valid, then it follows that the pictographs can be ascribed to either the ethnographic Northern Paiute of Shoshone groups who are known to have occupied the area aboriginally. However, it is interesting to consider that Stewart (1941:418) reports that Paviotso (Northern Paiute) informants all knew about petroglyphs (and pictographs), but all denied that recent inhabitants made them. Some said they were made by Coyote, or the devil, or to "old time" (pre-Paiute) Indians. Stewart also asked whether petroglyphs occurred within band areas and several informants said they did not, even in cases where this was palpably false. It is especially odd that the Stillwater band denied the presence of petroglyphs when there are almost a dozen sites recorded in their territory, including the large one at Grimes Point (NV-Ch-3). The burden of evidence from Nevada, Heizer and Baumhoff (1962:227-228) argue, indicates that neither petroglyphs nor pictographs were made by recent Indians, although Steward's (1933) data suggest that they may not all be ancient.

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## APPENDIX VIII

### X-ray Diffraction Analysis of Pictograph Pigments from Painted Cave, Central Nevada

By

Janis Markman[1], James C. Bard[2] and Colin I. Busby[2]

### INTRODUCTION

Utilizing X-ray diffraction techniques, McKee and Thomas (1973) studied pictograph pigments taken from the walls of Toquima Cave (26-La-1), central Nevada. They determined that the paint was composed of a gypsum binder colored with hematite, goethite and charcoal. Gatecliff Shelter (26-Ny-301), located 12 miles south of Toquima Cave evidenced pictographs in various colors, especially white, yellow, orange, red and dark red (cf. Koski, McKee and Thomas 1973). X-ray analyses revealed that aragonite, gypsum and an alum mineral formed the binder (paint base) in all the samples with the unpigmented binder also serving as the white paint. Coloring agents consisted of lepidocrocite and possibly goethite for yellow and hematite, lepidocrocite and goethite for red. Orange hues were produced by mixing red and yellow minerals in varying proportions. Because the white paint and the base for the other ochres are composed of the same mineral ingredients in the same proportions, Koski, McKee and Thomas (1973:8) concluded that they were not a mixture of ingredients from different places. The aragonite, gypsum and alum components suggest a hot-spring deposit.

Detailed pigment analysis could help establish the extent and duration of prehistoric trade networks in the same way that diagnostic California shell beads help confirm the interregional trade networks between the Great Basin and California (cf. Bennyhoff and Heizer 1958). Similarly, X-ray analysis of obsidian has enabled California archaeologists to outline prehistoric trade/interaction networks (Jack and Carmichael 1969, Jack 1969 and

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2. Basin Research Associates, Oakland, California.

Ericson 1977). Koski, McKee and Thomas (1973:8) suggested that it is even possible that localized residential groups (bands) could have used distinctive minerals and that the analysis of paints from several sites might point toward territorial size, or perhaps ethnic boundaries (e.g. Northern Paiute vs. Western Shoshoni).

Perhaps the most important potential result of pigment analyses might be the identification of social groups by their use of certain pigments and pigment mixing processes. Most rock art typologies are based on common stylistic elements, however almost all ethnographic groups paint concentric circles, cross-hatched grids, wavy lines, etc.. Unique pigment composition could provide a better social fingerprint than such amorphous styles. Koski, McKee and Thomas have demonstrated that the Gatecliff and Toquima pigments were formulated by mixing gypsum with colored minerals, however Steward (1941:298) has reported that the historic period Shoshoni utilized a mixture of animal fat and ochre. Not only can pigment analysis serve as a check on the veracity of ethnographic accounts by also can identify distinctive binders (e.g. minerals, fats, water, vegetal matter, etc.) as meaningful cultural and temporal indices. Koski, McKee and Thomas (1973:8) point out that data from other parts of the Great Basin were not available for comparison. The following pigment analysis from one site represents our efforts to begin comparative studies of Great Basin pictograph pigments.

## METHOD OF ANALYSIS

Excavation at Painted Cave (26-Pe-40) yielded 10 small nodules or pieces of mineral ochre material. Present on the rear cave wall is a large panel of pictographs in red, orange/yellow, white and black (cf. Appendix III this report for details on pictograph design elements, colors and provenience). The pictographs are definitely contemporaneous with the occupational deposits and thus it is logical to hypothesize that the ochre was used for pictograph pigment as well as possible (body or other) ornamentation. Both the mineral ochre nodules and pigment smears obtained from the pictographs were analyzed by the X-ray diffraction technique outlined below.

The pictograph pigments were disolved with distilled water by daubing a wet camel hair water-color size paint brush against the pictographs. The pigment, which is water soluble to some extent, is drawn onto the brush and is then transfered to a standard glass slide (26 mm X 46 mm). The mineral and rock nodules were ground with an agate mortar and pestle to approximately minus 270 mesh and placed into aluminum cell packs for analysis. Mineral phases were then identified by X-ray diffraction methods at the United States Geological Survey in Menlo Park, California. X-ray patterns (diffractograms) were produced by a vertical powder diffractometer using copper radiation and a scintillation detector. The pecks in the diffractograms (Figure I) represent crystal lattice spacing which are used to determine the various minerals. Mineral identification is based on the Inorganic Powder Diffraction File 1972 (published by JCPS, Philadelphia) and the American Society for Testing and Materials Powder Data File.

## RESULTS

Nine pictograph smears were obtained from the decorated rear wall of Painted Cave (cf. Table I). Samples 1 and 5 were red pigment as were samples 2 and 3 which were combined on one slide and analyzed as one sample. Sample 4 was faded red pigment while samples 6 and 7, which were combined on one slide, were an orange color. Sample 8 was white pigment and 9 was white pigment which was aboriginally smeared with red pigment and charcoal. Unfortunately both samples 8 and 9 contained insufficient material to yield a diagnostic X-ray pattern.

Analysis of samples 1 and 5 revealed the presence of gypsum but there was insufficient material to determine what mineral caused the red color of the paints. The orange colored paint, combined samples 6 and 7 showed evidence of gypsum but again there was insufficient material to obtain a pattern for minerals. Koski, McKee and Thomas (1973:6) note that orange hues were produced by mixing red and yellow minerals in varying proportions. Also the orange color could be due to limonite ($FeO.OH.nH_2O$). Limonite varies from yellow to brownish red with yellow brown, orange brown and brownish black being possible colors. Limonite consists mostly of cryptocrystalline goethite ($HFeO_2$) and/or lepidocrocite ($FeO(OH)$) with absorbed water and occurs with weathering of iron minerals. Limonite does not produce diagnostic X-ray patterns and is considered to be amorphous or to have irregular structure. Analysis of combined samples 2 and 3 revealed that the red paint was made of lepidocrocite with gypsum as a binder (Figure 1a). Lepidocrocite is a weathering product of iron minerals and is dimorphous with goethite, the color varying from brown to red. Finally, sample 4, a sample of paint from a faded red pictograph, evidenced gypsum and unidentified clays which may or may not have been the coloring agent.

Analysis of a sample of cave wall, showed that the wall formation is composed of arenitic limestone (calcite and quartz)(See Figure 1f). Calcite ($CaCO_3$) is also a common secondary cave wall precipitate. Thus it is difficult not to get some calcite mixed with the pigment when collecting samples. It is worth noting that the field procedure used here to obtain pigment smears tends to decrease the chance of significant calcite or quartz contamination in the samples and is an improvement over the scraping off of pictograph pigment as reported by McKee and Thomas (1973) and Koski, McKee and Thomas (1973). Although insufficient pigment was obtained by paint brush and distilled water methods, this problem can be overcome by disolving more pigment for transfer to the slides. The presence of quartz or calcite in the X-ray patterns of the 10 mineral (ochre) nodules should be viewed as a contaminant from cave wall precipitates.

Ten mineral nodules of ochre material were recovered from the deposits at Painted Cave (Table 1). Analysis of the red colored nodules revealed that hematite was the primary mineral used to create red paint (Figure 1b, e). Hematite ($Fe_2O_3$) is a earthy red weathering product of iron minerals. Specimens 2-61828 (Figure 1e) and 2-61854 have calcite contamination. Specimens 2-61850, 2-61859, 2-61935 (Figure 1b) and 2-61931 are composed of hematite and unidentified clays (probably the kandite group). The kandite group of kaolinite clays ($Al_4[Si_4O_{10}](OH)_8$) vary from white to red to brown to blue in color depending on composition. These minerals are grouped together on the basis of variably stacked sheet-like crystal structure and are formed by alteration or weathering of feldspars. It is not known if the kandite clays associated with the red hematite nodules are incidental contamination from the cave deposits or from the ground matrix from which the hematite was quarried, or represent the intentional addition of clay into the hematite nodules (possibly man made) in order to achieve a certain hue of red color. Analysis of the white mineral nodules showed that specimen 2-61894 (Figure 1c) was composed entirely of gypsum. Gypsum ($CaSO_4.2H_2O$) is usually white or colorless and is often found in association with calcite, aragonite and dolomite although its main occurrence is with limestone, shale, marl, clays and evaporite deposits. Based on the presence of gypsum mixed with other minerals (e.g. hematite) on the smears, it is evident that is was intentionally mixed with colored minerals to form paint - the gypsum being an excellent binder and color base. Analysis of white colored specimen 2-61903 (Figure 1d) showed that the nodule is composed of calcite with traces of aragonite. Aragonite ($CaCO_3$) is typically colorless or white and is a relatively unstable form of crystalline $CaCO_3$. It appears as a precipitate in caves and is also found under hydrothermal conditions (hot-springs). The possibility that this specimen derived from a hot-spring environment can not be ruled out. Two very large hot-springs; Kyle Hot Springs in the nearby Buena Vista Valley and Leach Hot Springs in close-by Grass Valley (cf. Bowman, Hebert, Wollenberg and Asaro 1975) are well within the territory of the aboriginal inhabitants of Painted Cave. Analysis of the orange colored nodule (2-61931) shows a trace of gypsum and calcite contamination. We were unable to determine the source of the orange color. Specimen 2-61920, the yellow color nodule is composed of unidentified clays and some calcite contamination is present in it.

## CONCLUSIONS

The X-ray analyses of Painted Cave pigment smears and mineral ochre nodules demonstrate many similarities to the findings of Koski, McKee and Thomas (1973) for Toquima Cave and Gatecliff Shelter. At Painted Cave, the late prehistoric inhabitants utilized gypsum and aragonite as a paint base material and as a source of white paint. The minerals hematite and lepidocrocite were added to or mixed with, gypsum or aragonite binders to produce red paint. Yellow and orange paints were produced by mixing the gypsum or aragonite binder to either clay or possibly limonite. A faded red pictograph (older?) was found to be composed of clays and gypsum binder perhaps indicating the earlier pictographs at this site were made of clay origin colors as opposed to minerals such as hematite. Radiocarbon dates from excavated hearths in the Painted Cave deposits indicate that the site was utilized in late prehistoric times (Appendix VII). The pictographs are most probably contemporaneous with the occupation of the cave itself.

Koski, McKee and Thomas (1973:7) did not know of any prehistoric ochre mines or quarries in central Nevada, and we know of no such localities in the vicinity of Painted Cave. Although specific collecting sites for ochre minerals are not presently known, it is probable that the ochres were collected when found and retained for later use. As for the source of the binder materials, Koski, McKee and Thomas suggest that Gatecliff and Toquima gypsum and aragonite binders were obtained from a local hot-spring (Diana's Punch Bowl). Painted Cave inhabitants may have possibly obtained gypsum and aragonite from nearby Kyle or Leach hot-springs. In any case, the minerals used at all three sites are common forms in the Great Basin. Although there was a wider range of materials used at Toquima and Gatecliff, the procedures and minerals used at Painted Cave, over a hundred miles distant, are very similar to those used at the above two sites. As discussed in the main report, Painted Cave is located in an area utilized by both western Shoshoni and Northern Paiute peoples. Since Painted Cave might have been utilized by the western Shoshoni, the same group responsible for the Toquima and Gatecliff pictographs, the similarities between Painted Cave and the other two sites may be culturally significant. Admittedly, these connections are speculative, but we suggest that the sampling and analysis of pictograph pigments from other areas of the Great Basin, especially from sites attributed to the neighboring Northern Paiute and Southern Paiute groups, might reveal how widespread are the use of these central Nevada (or western Shoshoni) pictograph making procedures and mineral selections.

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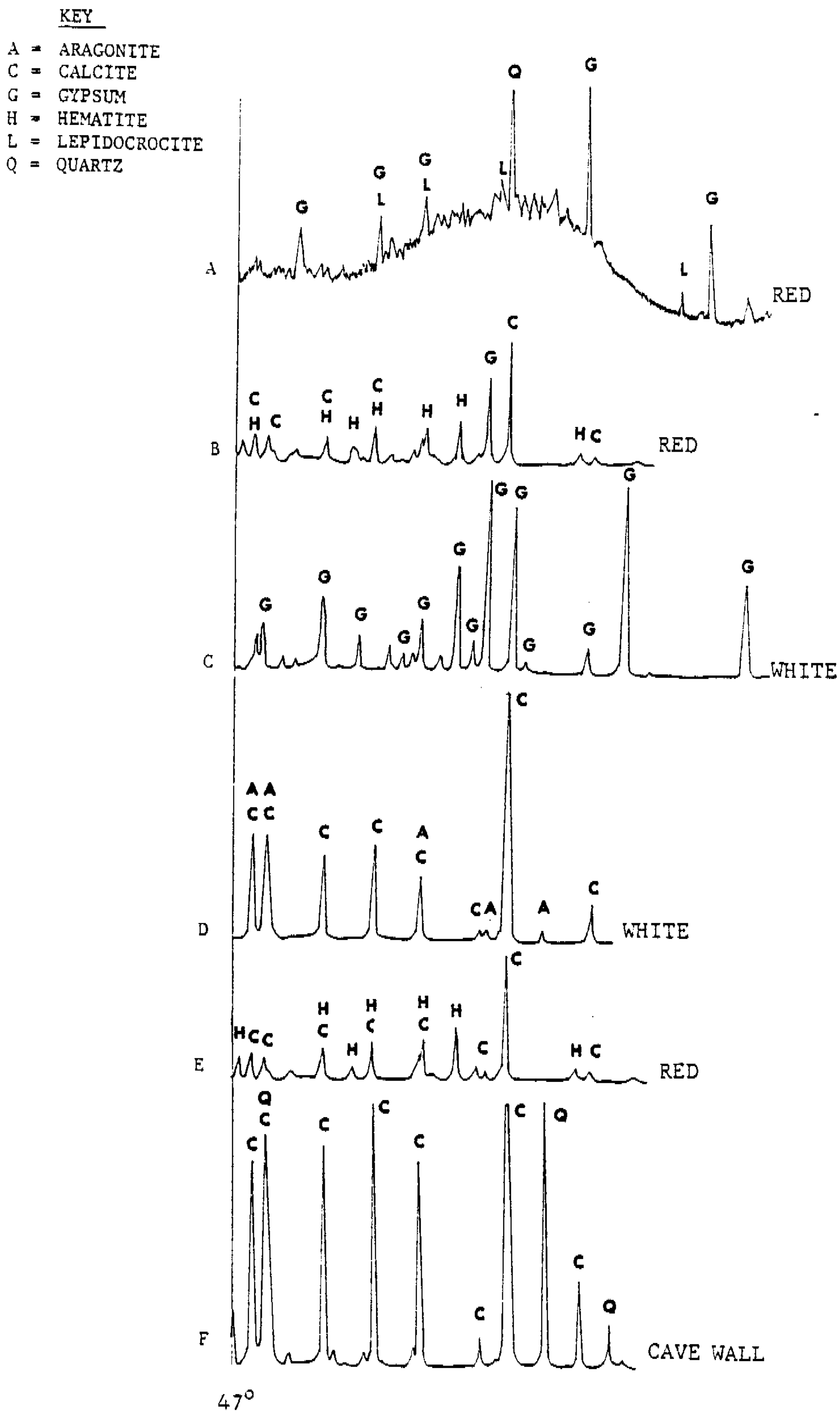
TABLE I

| Catalog Number | Provenience | | | Color | Composition* |
|---|---|---|---|---|---|
| 2-61828 | S6E6 | SW¼ | Screen 10-20 cm BS | Red | Hematite (Calcite) |
| 2-61831 | S6E6 | NE¼ | Screen 10-20 cm BS | Orange | Trace of Gypsum (Calcite) |
| 2-61850 | S6E6 | SW¼ | Screen 20-30 cm BS | Red | Hematite, Unid. Clay (Calcite) |
| 2-61854 | S6E6 | NW¼ | Screen 20-30 cm BS | Red | Hematite (Calcite) |
| 2-61859 | S6E6 | NW¼ | Screen 20-30 cm BS | Red | Hematite, Unid. Clay (Calcite) |
| 2-61894 | S6E6 | SE¼ | Screen 50-60 cm BS | White | Gypsum |
| 2-61903 | S6E6 | NW¼ | Screen 50-60 cm BS | White | Traces of Aragonite (Calcite) |
| 2-61920 | S6E4 | SE¼ | Screen 10-20 cm BS | Yellow | Unid. Clays (Calcite) |
| 2-61931 | S6E4 | SE¼ | Screen 30-40 cm BS | Red | Hematite, Unid. Clay (Calcite) |
| 2-61935 | S6E4 | SE¼ | Screen 40-50 cm BS | Red | Hematite, Unid. Clay (Calcite) |

* material in paranthesis (Calcite) is probably a contaminant from cave wall precipitates.

| | | |
|---|---|---|
| Cave Wall | | Quartz, Calcite |
| Smear (sample) 1 | Red | insufficient material, Gypsum |
| Smear (sample) 2 and 3 (Combined) | Red | Lepidocrocite, Gypsum |
| Smear (sample) 4 | Faded Red | Unid. Clays, Gypsum |
| Smear (sample) 5 | Red | insufficient material, Gypsum |
| Smear (sample) 6 and 7 (Combined) | Orange | (limonite ?), Gypsum |
| Smear (sample) 8 | White | insufficient sample |
| Smear (sample) 9 | White | insufficient sample |


KEY
A = ARAGONITE
C = CALCITE
G = GYPSUM
H = HEMATITE
L = LEPIDOCROCITE
Q = QUARTZ
A
RED
B
RED
C
WHITE
D
WHITE
E
RED
F
CAVE WALL
47°

F I G U R E I